



TRANSPORTATION MODEL FORUM

June 9, 2021

SANDAG



Forum Agenda

- Welcome and Introductions
- Travel Model Visualizations
- What Feeds the Beast
- Project Updates

Welcome and Introductions

- Staffing Updates
 - Welcome Pat Landrum!
 - Director of Data and Modeling
 - Welcome back Susan Xu!
- [New Model Website](#)
- Return to 401 B Street
- Pending Retirement: ABM1



TRAVEL MODEL VISUALIZATIONS

Gregor Schroeder
Jeff Yen

SANDAG





Service Bureau Mode Choice Report

Gregor Schroeder

Setting Up BI Tools for Success!

- What happens when an ABM2+ Model Run is completed?

1. ABM model run notifies a Microsoft Azure SQL Server database instance that the model run is complete and ready to be loaded
2. Each night the SQL Server instance looks for new notifications from ABM model runs and loads the final data files into the database.
3. This is done for every ABM model run. The database instance can hold thousands of ABM model runs.

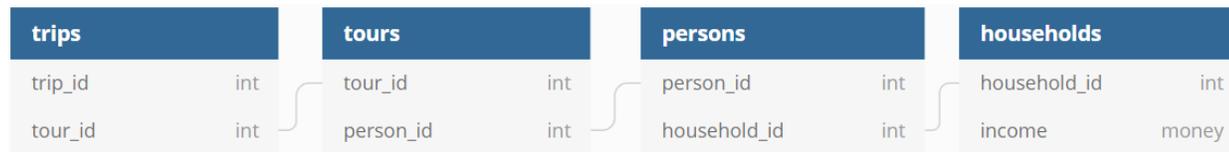
- Why is this important?

1. Makes management of thousands of ABM model runs possible
2. Allows analyst access to thousands of ABM model runs with minimal effort
3. Enables development of automated reporting procedures and helps to unlock the power of BI software.

Data Model Powers Up BI Tools

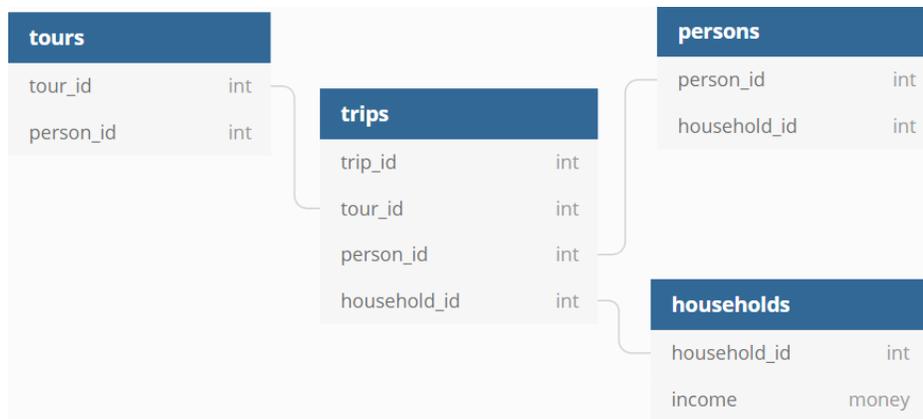
• Entity-Relationship Model

1. Relational. Third Normal Form (3NF). Prioritizes referential integrity, reducing data duplication. Can be slow and difficult to work with in BI software.



• Dimension Model

1. Star Schema. Prioritizes ease of use and speed. Everything is just one join away! BI software is made for this!!!



Service Bureau Mode Choice Report

Mode Choice Report

Test Project for Power BI Presentation

DEMOGRAPHICS

metric	Format Dem
Population	42,112
Households	16,953
Household Size	2.48
Employed Residents	19,714
Employees	11,382

STUDY AREA TRIPS

metric	Format MGRA
MGRA Intra-zonal	2,311
MGRA Inter-zonal	30,575
Total Trips	308,322
MGRA Intra-zonal Pct.	.75
Study Area Internal Vehicle Capture Rate	8.36

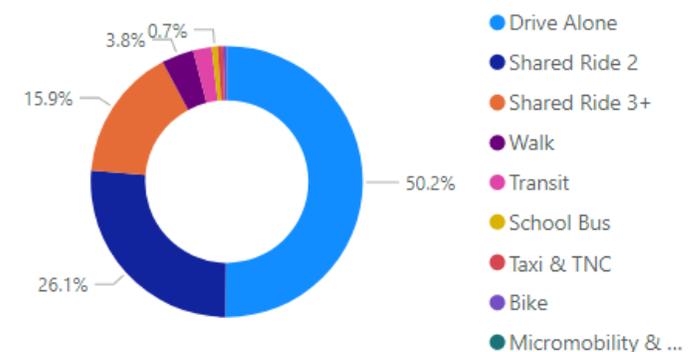
AVERAGE TRIP LENGTHS

metric	value
Resident Person Trip Length	6.39
Resident Auto-Trip Vehicle Trip Length	6.80
All Model Person Trip Length	6.47
All Model Vehicle Trip Length	6.84
Resident Round-Trip Commuter Tour Length	22.44
Employee Round-Trip Commuter Tour Length	29.02

DAILY MODE CHOICE

Mode	Percentage
Bike	0.4
Drive Alone	50.2
Micromobility & Microtransit	0.0
School Bus	0.7
Shared Ride 2	26.1
Shared Ride 3+	15.9
Taxi & TNC	0.6
Transit	2.2
Walk	3.8
Total Trips	100.0

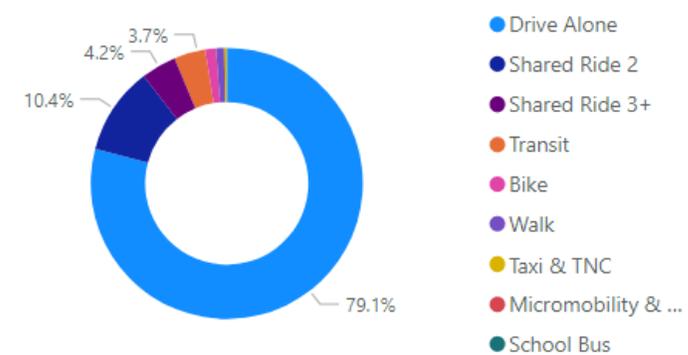
DAILY MODE CHOICE



PEAK COMMUTE MODE CHOICE

Mode	Percentage
Bike	1.3
Drive Alone	79.1
Micromobility & Microtransit	0.0
School Bus	0.0
Shared Ride 2	10.4
Shared Ride 3+	4.2
Taxi & TNC	0.3
Transit	3.7
Walk	1.0
Total Trips	100.0

PEAK COMMUTE MODE CHOICE



Scenario ID

155



Report Generated: 6/7/2021

ABM2+ Base Year Validation

Jeff Yen

Overview

- What's travel model validation?
- Traffic flow validation
- Major improvements
- Data visualization of ABM validation results

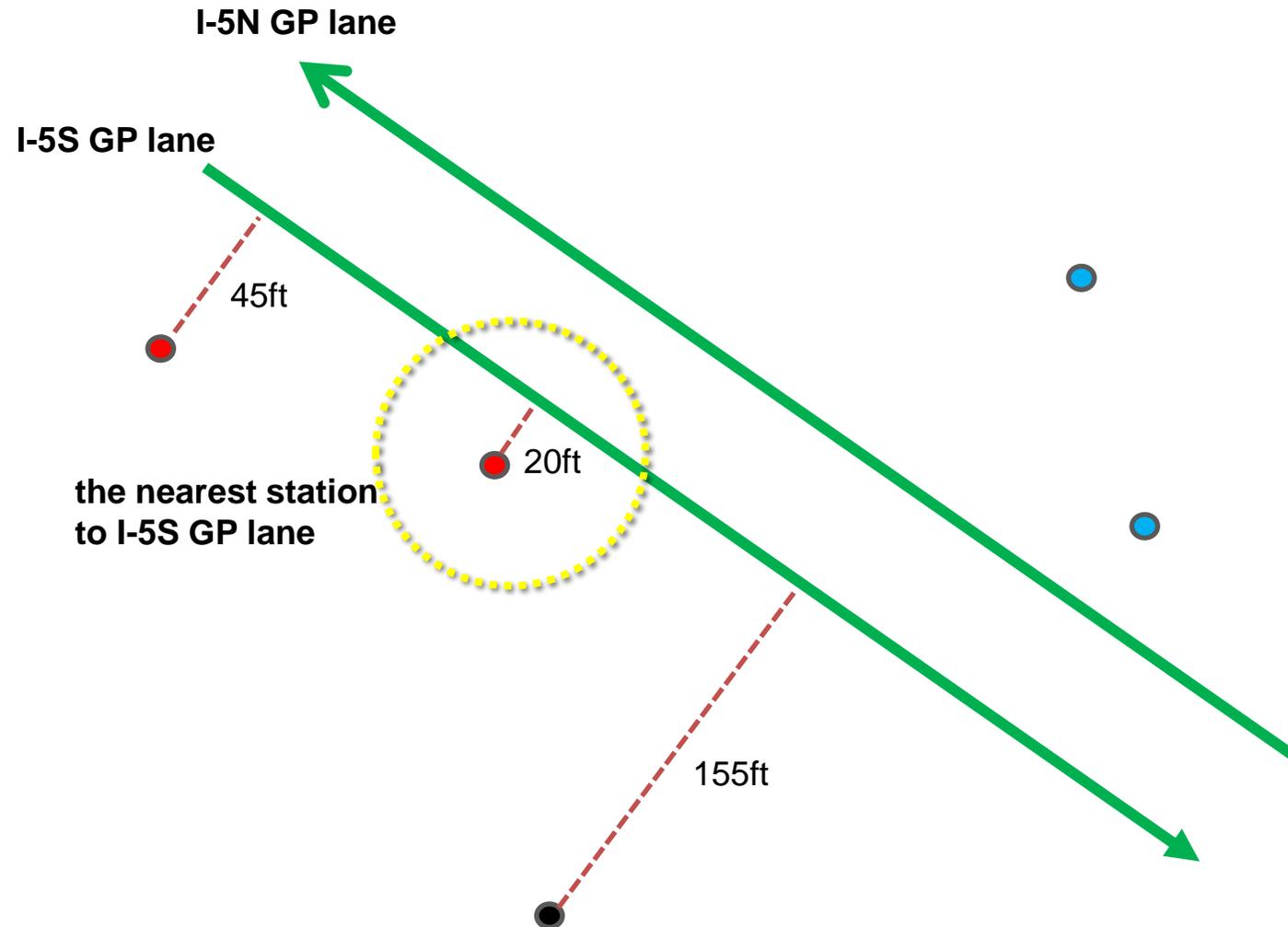
What's Travel Model Validation?

“The set of processes to verify the travel models have enough fidelity”

Traffic Volume Validation

- Data:
 - Observed counts obtained from SANDAG, local jurisdictions, and Caltrans District 11.
 - PeMS stations five-minutes data.
 - SANDAG roadway network.
- Workflows:
 - Cross-reference PeMS stations with SANDAG roadway network.
 - Produce Annual Average Count.
 - Perform ABM validation and visualize the results.

Cross-reference SANDAG Hwycov with PeMS stations

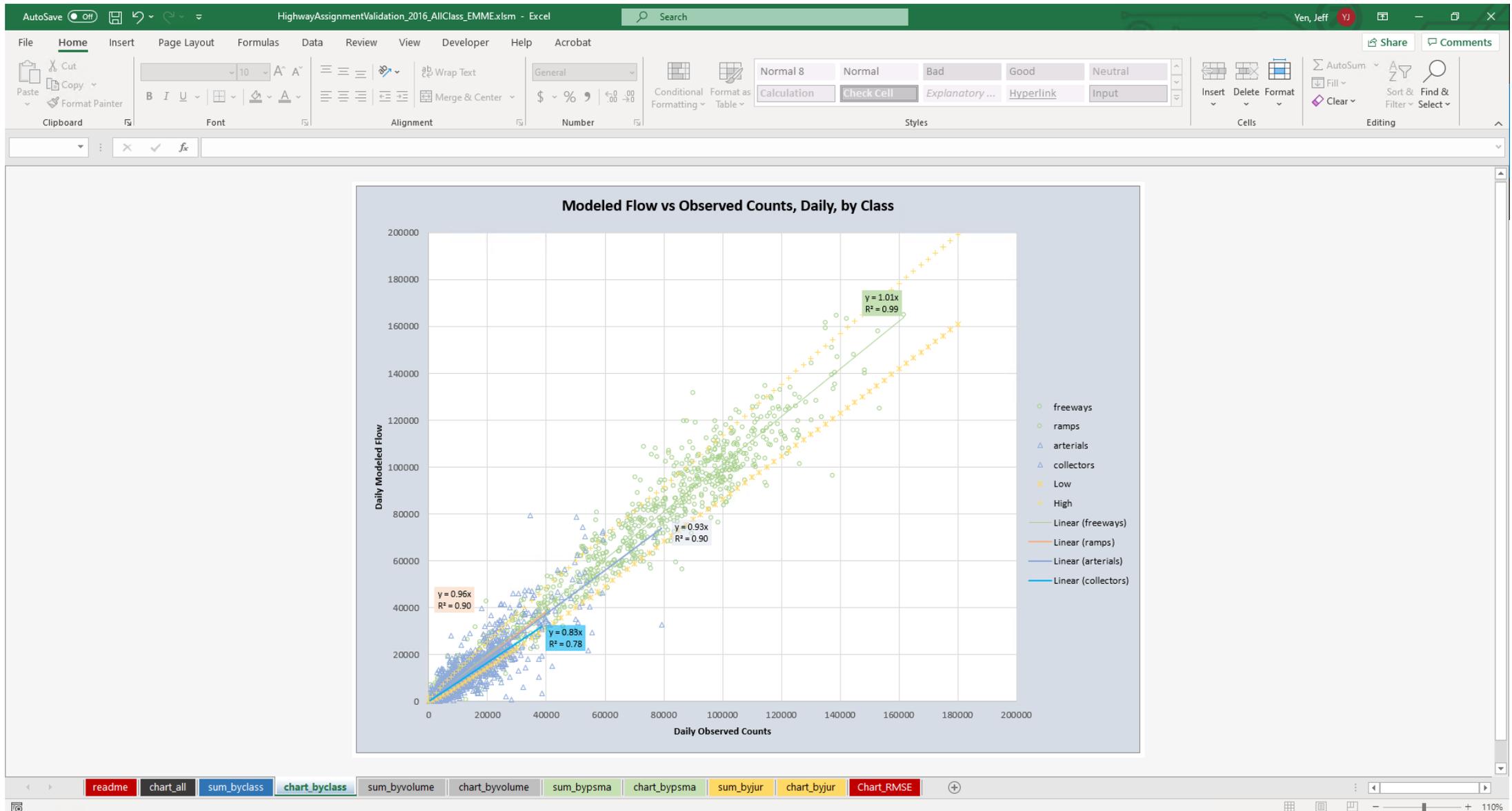


- I-5S GP station
- I-5N GP station
- Station out of distance threshold (150ft)

Major Improvements

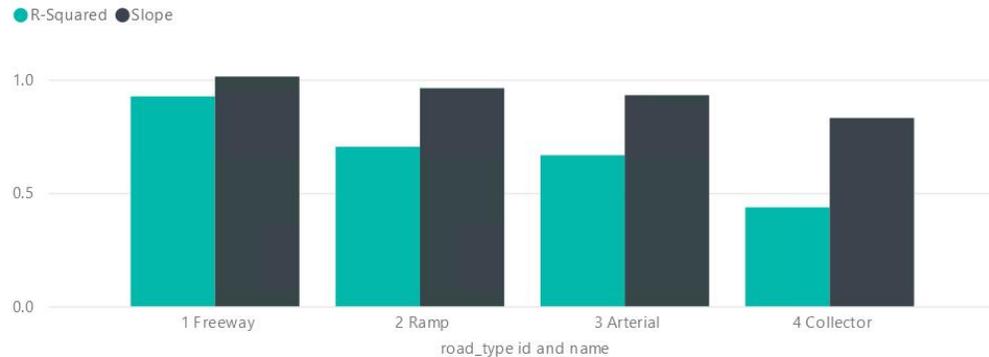
- Automated the cross-referencing processes using Python.
 - Enable the program reusability.
- Added more observed PeMS counts for ABM freeway validation.
 - Current: 612; before: 331.
- Enabled dynamic count inventory update in old Excel validation templates.
- Introduced new validation templates using Power BI.
 - Enhanced data visualization of model validation result.
 - Enabled the template shareability and reusability.

EXCEL Data Visualization (previous)

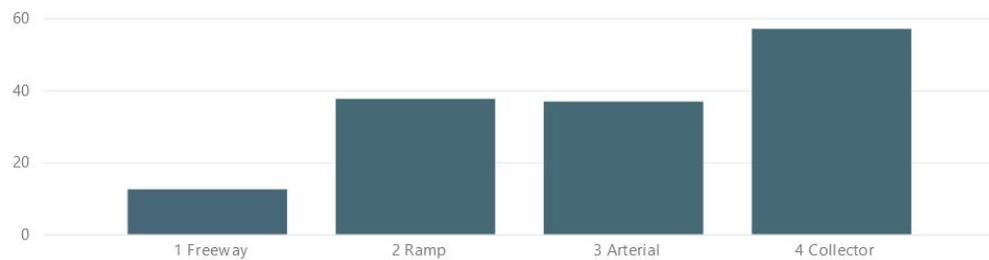


Data Visualization Enhancement by Power BI

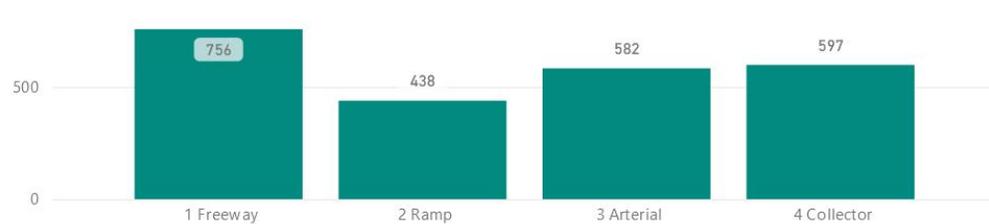
R-Squared & Slope



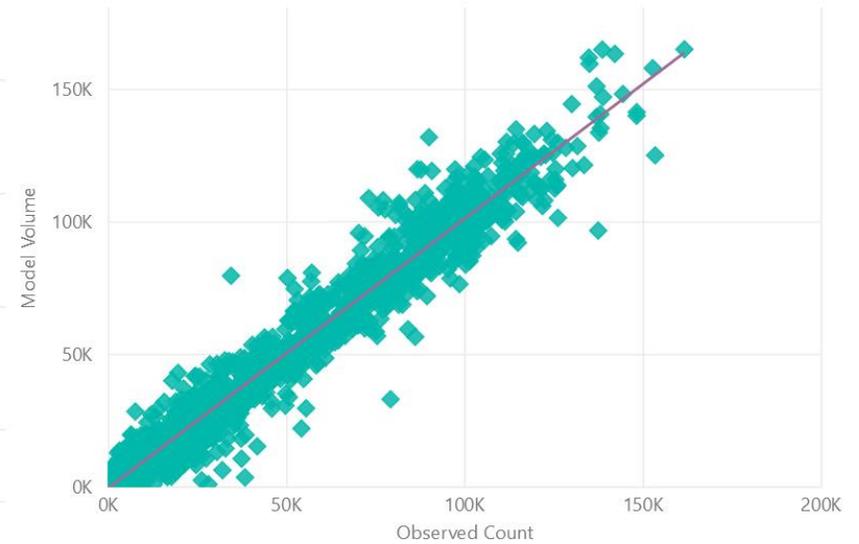
RMSE%



Number of Observed Counts



Model Volume vs Observed Count



1.01 Slope
0.96 R-Squared
21.57 RMSE%
2373 # of Observed Counts

Source of Observed Counts



Validation by Road Type

The 2016 daily observed counts and model flow are used throughout this Power BI validation template.

A road type filter is available on the x-axis label. Click on the label to select one or more types.





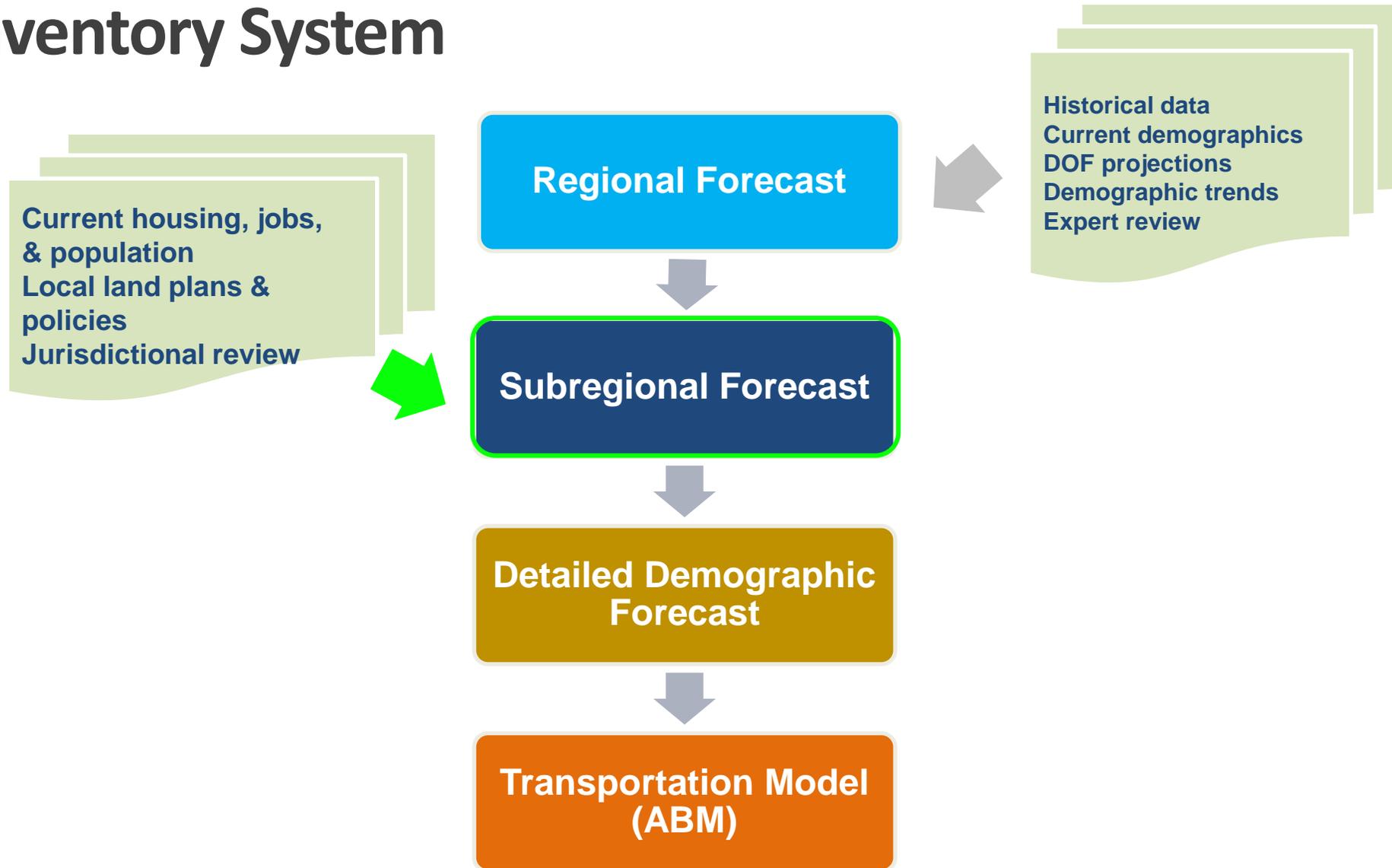
WHAT FEEDS THE BEAST

Grace Chung
David Tedrow

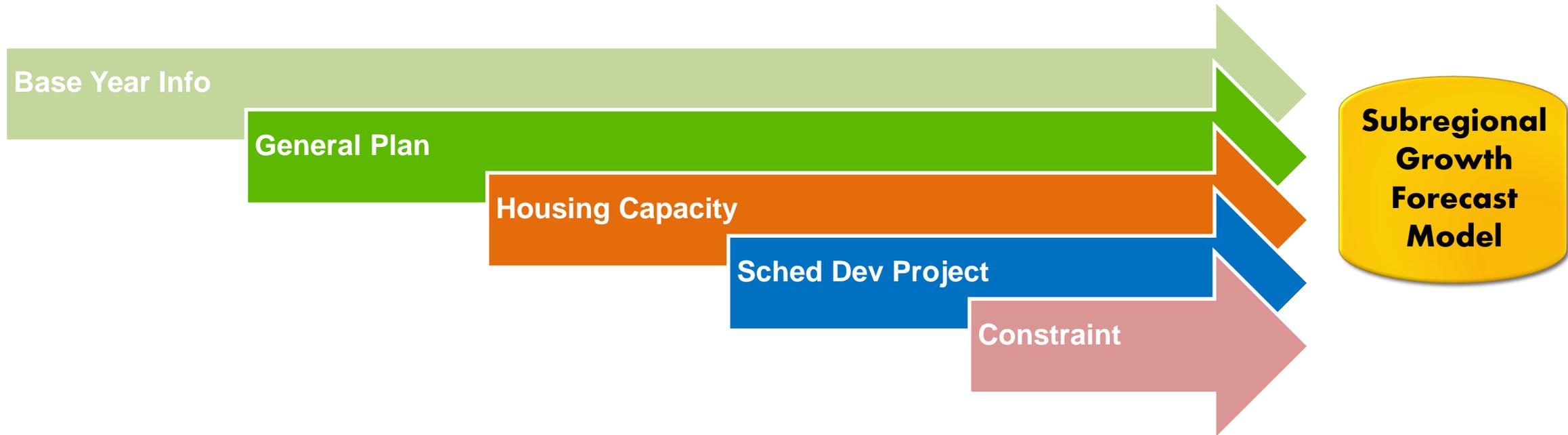
SANDAG



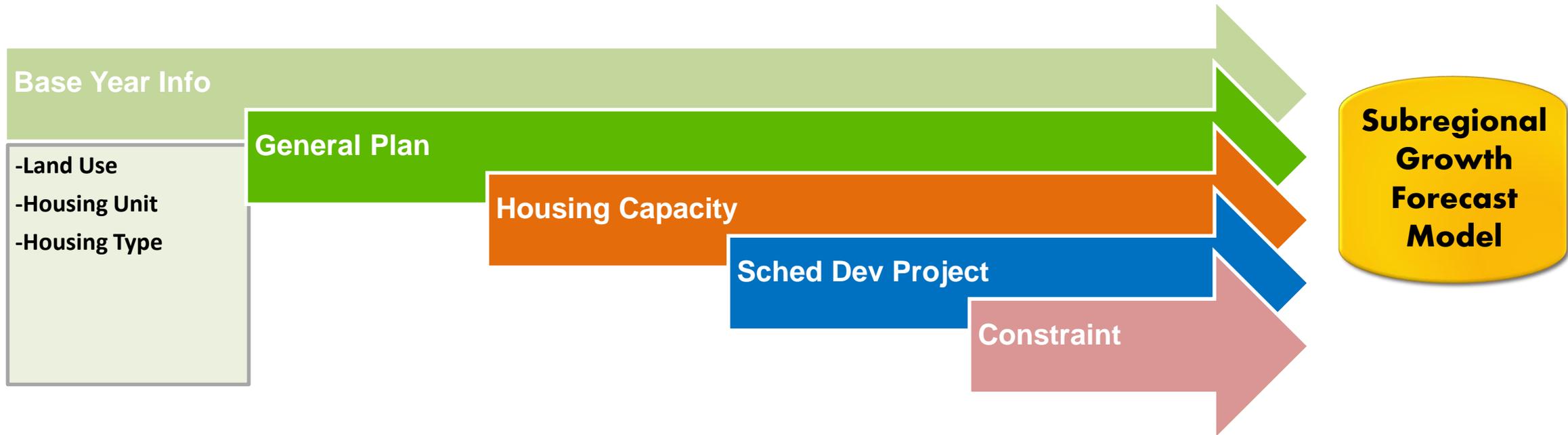
Land Inventory System



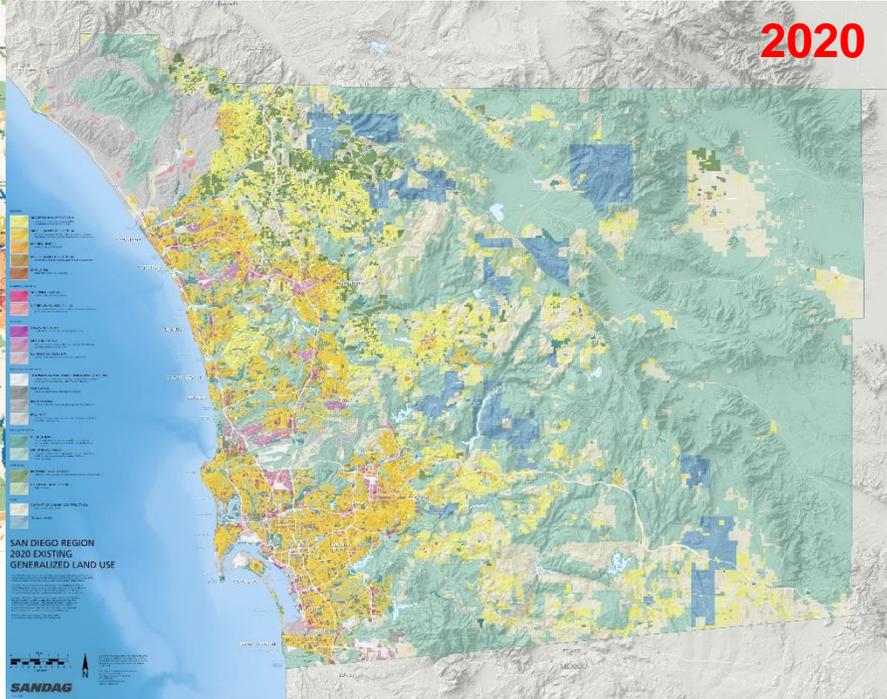
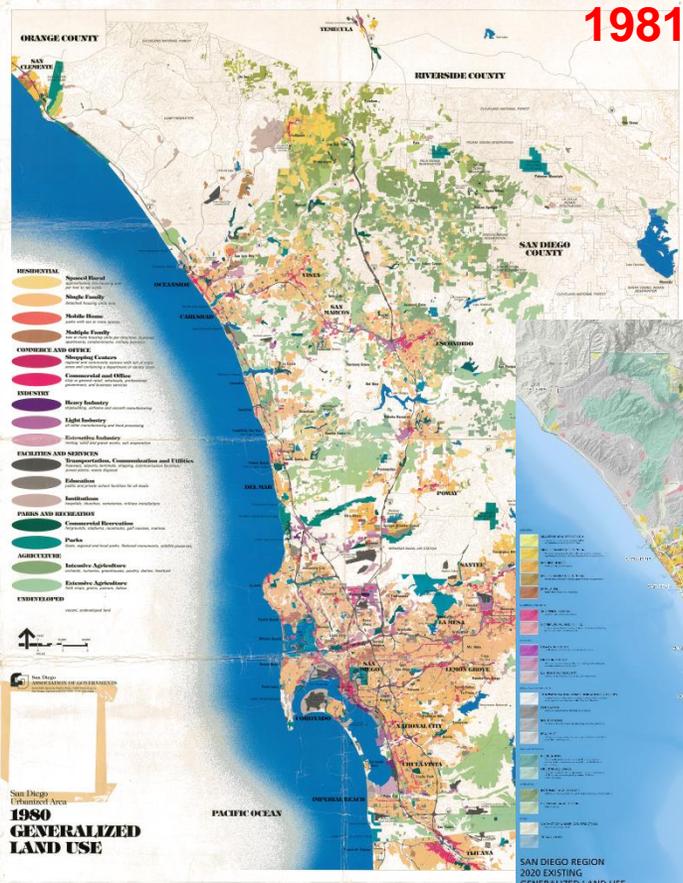
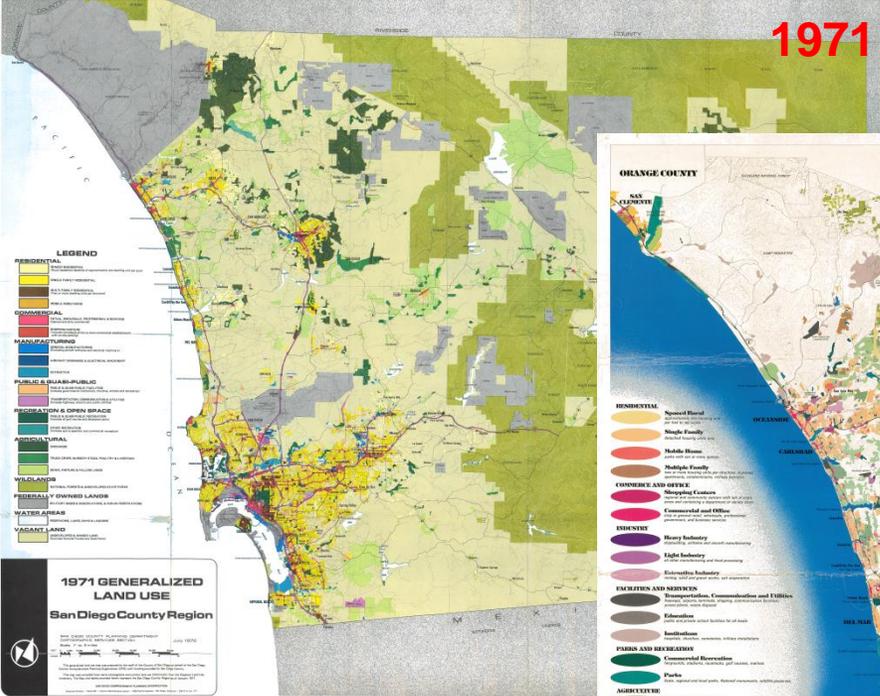
Land Inventory System



Land Inventory System



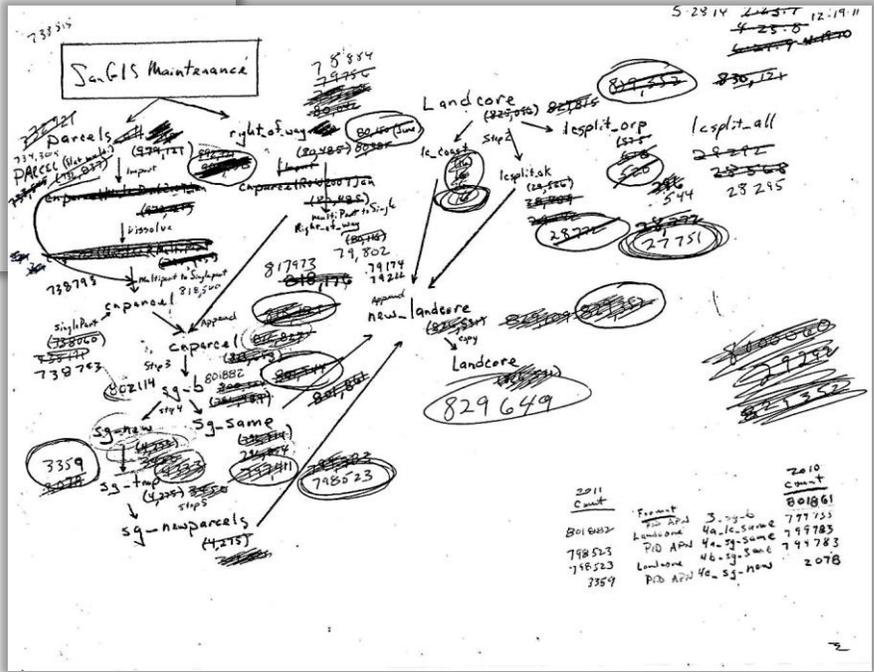
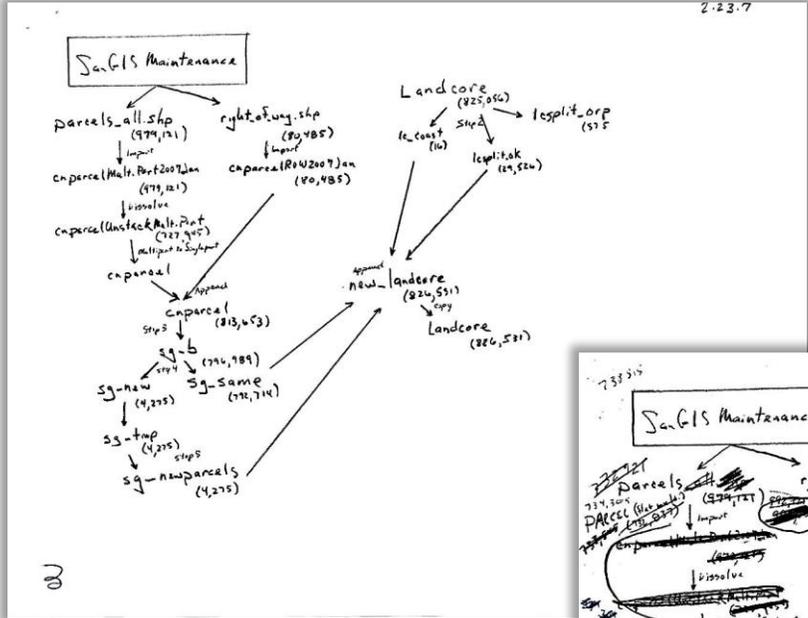
SANDAG's Land Inventory System



SANDAG's Land Inventory System

Parcel Integration Process

- Annual Process
- SanGIS Parcels and ROWs
- "LANDCORE" (Land Use Inventory editing layer)



SANDAG's Land Inventory System

Land Use Codes

SANDAG Land Use Coding

LU CODE	DESCRIPTION
1000	Spaced Rural Residential
1100	Single Family Residential
1110	Single Family Detached
1120	Single Family Multiple-Units
1190	Single Family Residential Without Units
1200	Multi-Family Residential
1280	Single Room Occupancy Units (SRO's)
1290	Multi-Family Residential Without Units
1300	Mobile Home Park
1400	Group Quarters
1401	Jail/Prison
1402	Dormitory
1403	Military Barracks
1404	Monastery
1409	Other Group Quarters Facility
1500	Hotel/Motel/Resort
1501	Hotel/Motel (Low-Rise)
1502	Hotel/Motel (High-Rise)
1503	Resort
2001	Heavy Industry
2100	Light Industry
2101	Industrial Park
2103	Light Industry - General
2104	Warehousing
2105	Public Storage
2201	Extractive Industry
2301	Junkyard/Dump/Landfill
4100	Airports
4101	Commercial Airport
4102	Military Airport
4103	General Aviation Airport
4104	Airstrip
4110	Other Transportation
4111	Rail Station/Transit Center
4112	Freeway
4113	Communications and Utilities
4114	Parking Lot - Surface
4115	Parking Lot - Structure
4116	Park and Ride Lot
4117	Railroad Right of Way
4118	Road Right of Way
4119	Other Transportation
4120	Marine Terminal

LU CODE	DESCRIPTION
5000	Commercial
5001	Wholesale Trade
5002	Regional Shopping Center
5003	Community Shopping Center
5004	Neighborhood Shopping Center
5005	Specialty Commercial
5006	Automobile Dealership
5007	Arterial Commercial
5008	Service Station
5009	Other Retail Trade and Strip Commercial
6000	Office
6001	Office (High-Rise)
6002	Office (Low-Rise)
6003	Government Office/Civic Center
6100	Public Services
6101	Cemetery
6102	Religious Facility
6103	Library
6104	Post Office
6105	Fire/Police Station
6108	Mission
6109	Other Public Services
6500	Hospitals
6501	UCSD/VA Hospital/Balboa Hospital
6502	Hospital - General
6509	Other Health Care
6700	Military Use
6701	Military Use
6702	Military Training
6703	Weapons Facility
6800	Schools
6801	SDSU/CSU San Marcos/UCSD
6802	Other University or College
6803	Junior College
6804	Senior High School
6805	Junior High School or Middle School
6806	Elementary School
6807	School District Office
6809	Other School

LU CODE	DESCRIPTION
7200	Commercial Recreation
7201	Tourist Attraction
7202	Stadium/Arena
7203	Racetrack
7204	Golf Course
7205	Golf Course Clubhouse
7206	Convention Center
7207	Marina
7208	Olympic Training Center
7209	Casino
7210	Other Recreation - High
7211	Other Recreation - Low
7600	Parks
7601	Park - Active
7603	Open Space Park or Preserve
7604	Beach - Active
7605	Beach - Passive
7606	Landscape Open Space
7607	Residential Recreation
7609	Undevelopable Natural Area
8000	Agriculture
8001	Orchard or Vineyard
8002	Intensive Agriculture
8003	Field Crops
9101	Vacant and Undeveloped Land
9200	Water
9201	Bay or Lagoon
9202	Lake/Reservoir/Large Pond
9300	Indian Reservation
9400	Public/Semi-Public
9500	Under Construction
9501	Residential Under Construction
9502	Commercial Under Construction
9503	Industrial Under Construction
9504	Office Under Construction
9505	School Under Construction
9506	Road Under Construction
9507	Freeway Under Construction
9600	Specific Plan Areas
9700	Mixed Use

SANDAG GIS Last revision: September 18, 2007

LAND USE DEFINITIONS

1000 SPACED RURAL RESIDENTIAL – Single family homes located in rural areas with lot sizes greater than 1 acre. Rural residential estates may have small orchards, fields or small storage buildings associated with the residential dwelling unit.

1100 SINGLE FAMILY RESIDENTIAL

1110 SINGLE FAMILY DETACHED – Single family detached housing units, on lots smaller than 1 acre. Newer developments may include clubhouses, recreation areas, pools, tennis, etc. located within and associated with the residential development, if a separate parcel/lot designation does not exist.

1120 SINGLE FAMILY MULTIPLE-UNITS – Includes single family attached housing units, duplexes, townhouses, and lower density condominium developments (in general, less than or equal to 2 units per acre).

1300 MOBILE HOME PARK – Includes mobile home parks with 10 or more spaces that are primarily for residential use. (RV parks are included within the commercial recreation category).

1190 SINGLE FAMILY RESIDENTIAL WITHOUT UNITS – Single family detached housing units, on lots smaller than 1 acre. Newer developments may include clubhouses, recreation areas, pools, tennis, etc. located within and associated with the residential development, if a separate parcel/lot designation does not exist.

1400 GROUP QUARTERS

1401 JAIL/PRISON/BORDER PATROL HOLDING STATION

1402 DORMITORY

1403 MILITARY BARRACKS

1404 MONASTERY

1409 OTHER GROUP QUARTERS FACILITY – Convalescent or retirement homes not associated with or within a health care facility, rooming houses, half-way houses, etc.

1500 HOTEL/MOTEL/RESORT

1501 HOTEL/MOTEL (LOW-RISE) – Accommodations with three or fewer floors. Primarily found in downtown areas.

1502 HOTEL/MOTEL (HIGH-RISE) – Accommodations with four or more floors. Primarily found in downtown areas.

1503 RESORT – Resorts with recreational facilities. Examples of resorts include Olympic Resort in Carlsbad and San Marcos Resort.

2000 HEAVY INDUSTRY

2001 HEAVY INDUSTRY – Usually large buildings located near freeways, industrial or strip commercial areas. Typically large, 20-50 acres.

2100 LIGHT INDUSTRY

2101 INDUSTRIAL PARK – Office/industrial uses clustered into a center. The primary uses are industrial but may include high percentages of other uses in service or retail activities.

2103 LIGHT INDUSTRY-GENERAL – All other industrial uses and manufacturing not included in the categories above. These are not located inside of parks, but are usually along major streets or clustered in certain areas. Includes manufacturing uses such as lumber, furniture, paper, rubber, stone, clay, and glass; as well as light industrial uses as auto repair services and recycling centers. Mixed commercial and office uses (if not large enough to be identified separately) are also included. General industrial areas are comprised of 75 percent or more of industrial uses (manufacturing, warehousing, and wholesale trade).

2104 WAREHOUSING – Usually large buildings located near freeways, industrial or strip commercial areas.

2105 PUBLIC STORAGE – Public self-storage buildings are typically long, rectangular and closely spaced. Also includes RV storage areas.

2200 EXTRACTIVE INDUSTRY

2201 EXTRACTIVE INDUSTRY – Mining, sand and gravel extraction, salt evaporation.

2300 JUNKYARDS/DUMPS/LANDFILLS

2301 JUNKYARD/DUMP/LANDFILL – The landscape should show visible signs of the activity. Also include auto wrecking/dismantling and recycling centers.

4100 AIRPORTS

4101 COMMERCIAL AIRPORT – Lindbergh Field only.

4102 MILITARY AIRPORT – Airports owned and operated by the military. Found on Military bases.

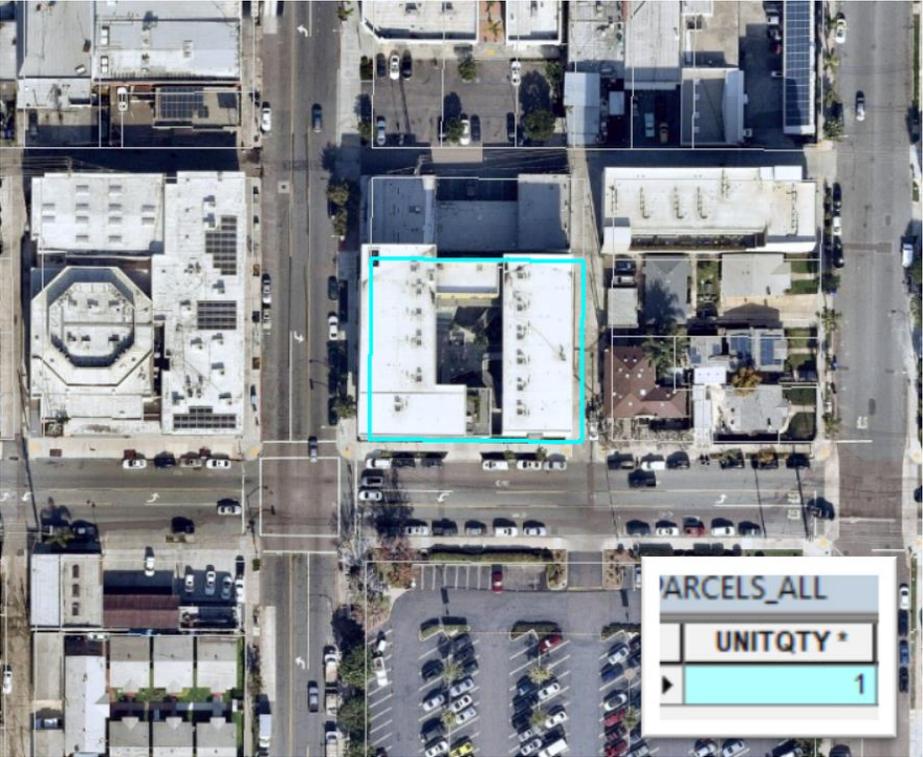
4103 GENERAL AVIATION AIRPORT – All general aviation airports.

SANDAG's Land Inventory System



General Existing Land Use	Commercial Office
Existing Land Use	6001 Office - High Rise
Planned Land Use	6001 Office - High Rise
Existing Ownership	500 Private
Dwelling Units	0
APN 8	53352211
Parcel ID	27949

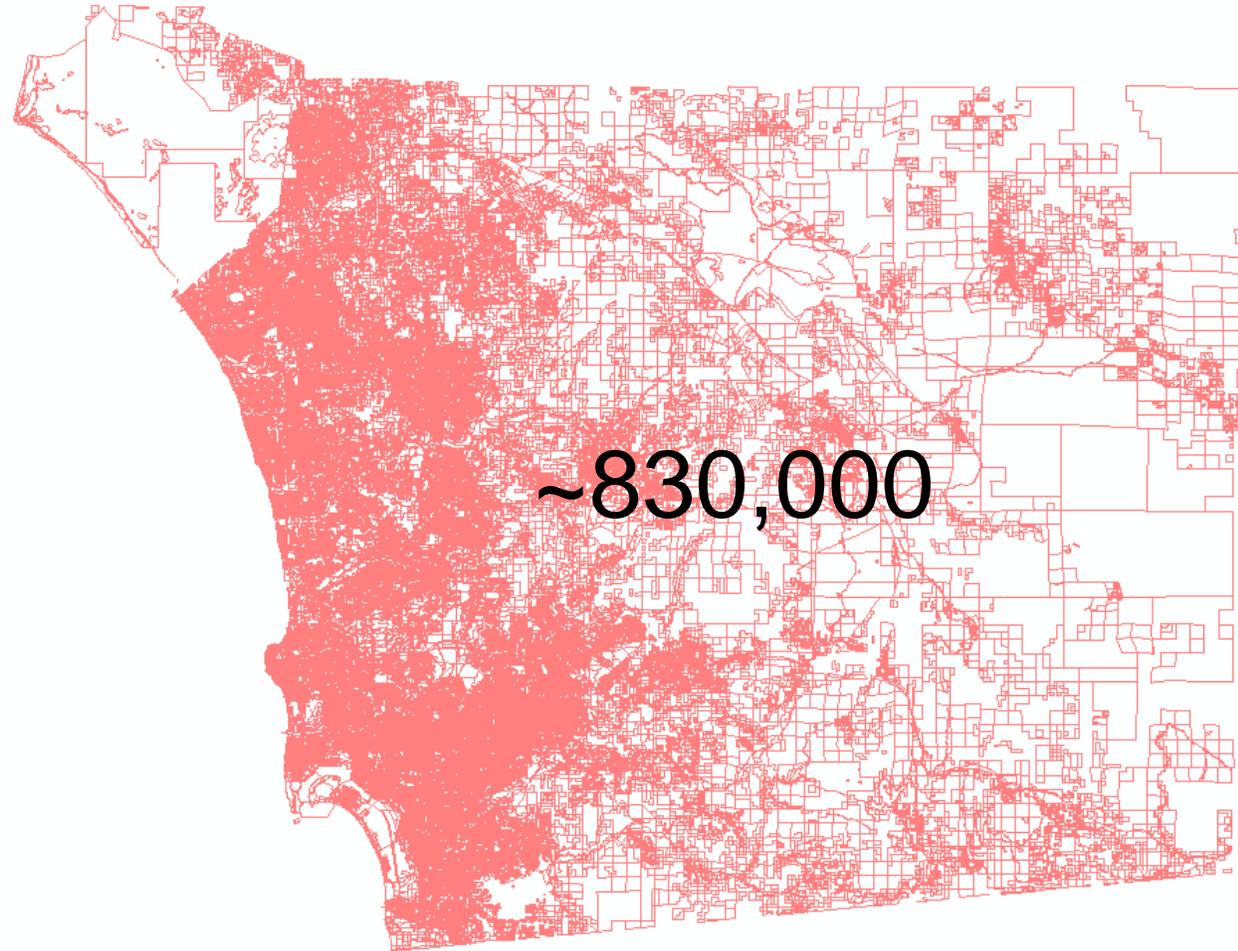
SANDAG's Land Inventory System



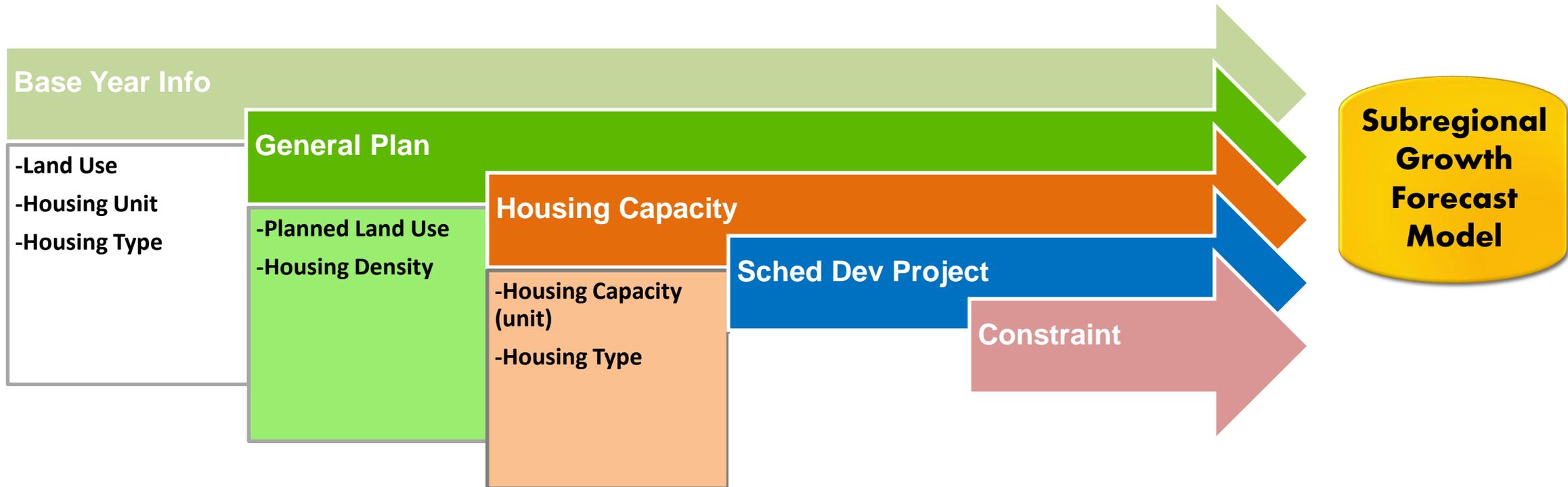
SPACECORE.GIS.Landcore

OBJECTID *	subParcel *	parcelID	apn8	lu	plu	du	genOwnID	MGRA *
2387781	3955900	39559	44623312	9700 Mixed Use	9700	39	500 Private	407

Land Inventory System

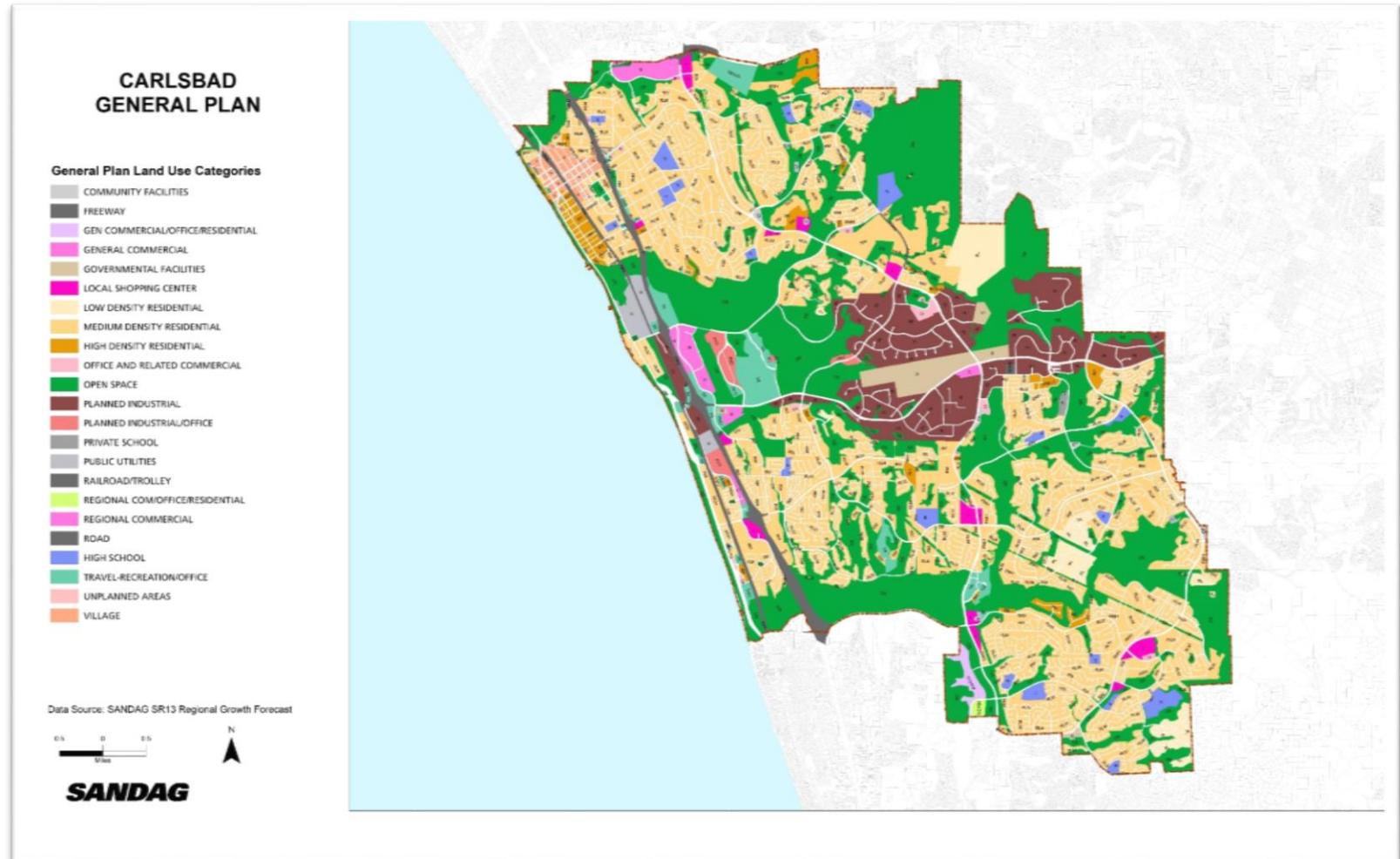
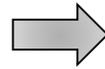
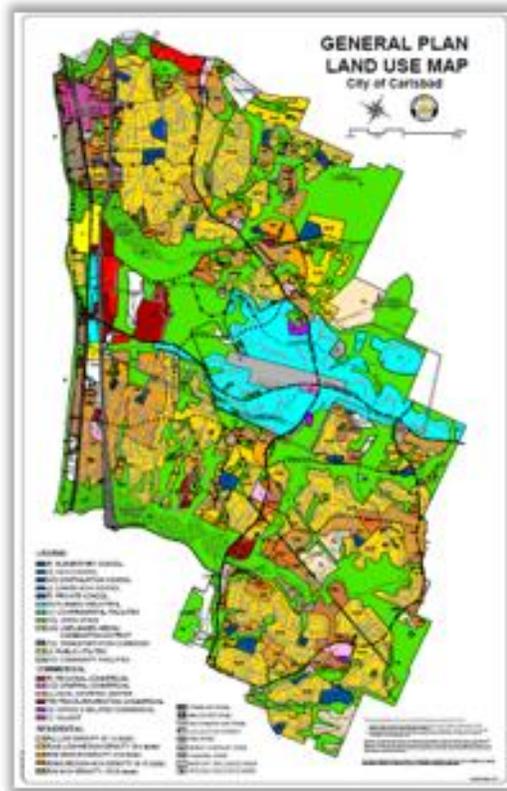


Land Inventory System



Land Inventory System

General Plan (or community plans from local jurisdictions)



Land Inventory System

Housing Capacity

ENCINITAS (1 of 3) HOUSING CAPACITY

2015 Estimates:

Total Population = 64,473
Household Population = 60,945
Persons Per Household = 2.50
Housing Units = 25,819
Vacant = 5.7%

- ★ Coaster Station
- State Routes
- Railroads
- ▭ City
- ▭ Open Space
- ▭ Scheduled Development

Municipal Zoning Capacity = 2,829

Series 13 Capacity = 2,272

Housing Units

- ▭ 1
- ▭ 2 to 5
- ▭ 6 or more

LEGEND EXPLAINED

Municipal Zoning Capacity (hatch overlay) – represents municipal zoning districts at the parcel level that allow residential development to occur based on the SANDAG interpretation of zoning from the city's zoning ordinances available online. The number will in each parcel represents the SANDAG interpretation of the maximum allowable number of additional housing units or net housing units (maximum units minus current (2015) units) that the parcel can accommodate based on the current municipal zoning. Because the base year for Series 14 is 2015, current units reflect what is on the ground as of January 1, 2015, not what is currently on the ground.

Series 13 Capacity (purple) – represents the parcels that were used by SANDAG in Series 13 forecast to allocate growth of population and housing on a sub-regional level. The number in those parcels represent the additional number of housing units (net units) that were given to SANDAG during Series 13 jurisdictional outreach. The shade of purple (light to dark) corresponds to the number or range of additional housing units that can be developed on those parcels, with darker shades representing 6 or more units per parcel.

Scheduled Development (yellow) – known developments in the pipeline that intend to add additional housing unit capacity to the parcel, irrespective of current municipal zoning based on information received from jurisdictions solicited for Series 13 or during prior forecast outreach.

Housing Element Site (red outline) – sites identified by the jurisdiction to have potential for additional housing unit capacity at 20 dwelling units per acre or more, as mandated through the Regional Housing Needs Assessment (RHNA). If these sites represent pipeline projects that are likely to occur, please include them in the scheduled development events.

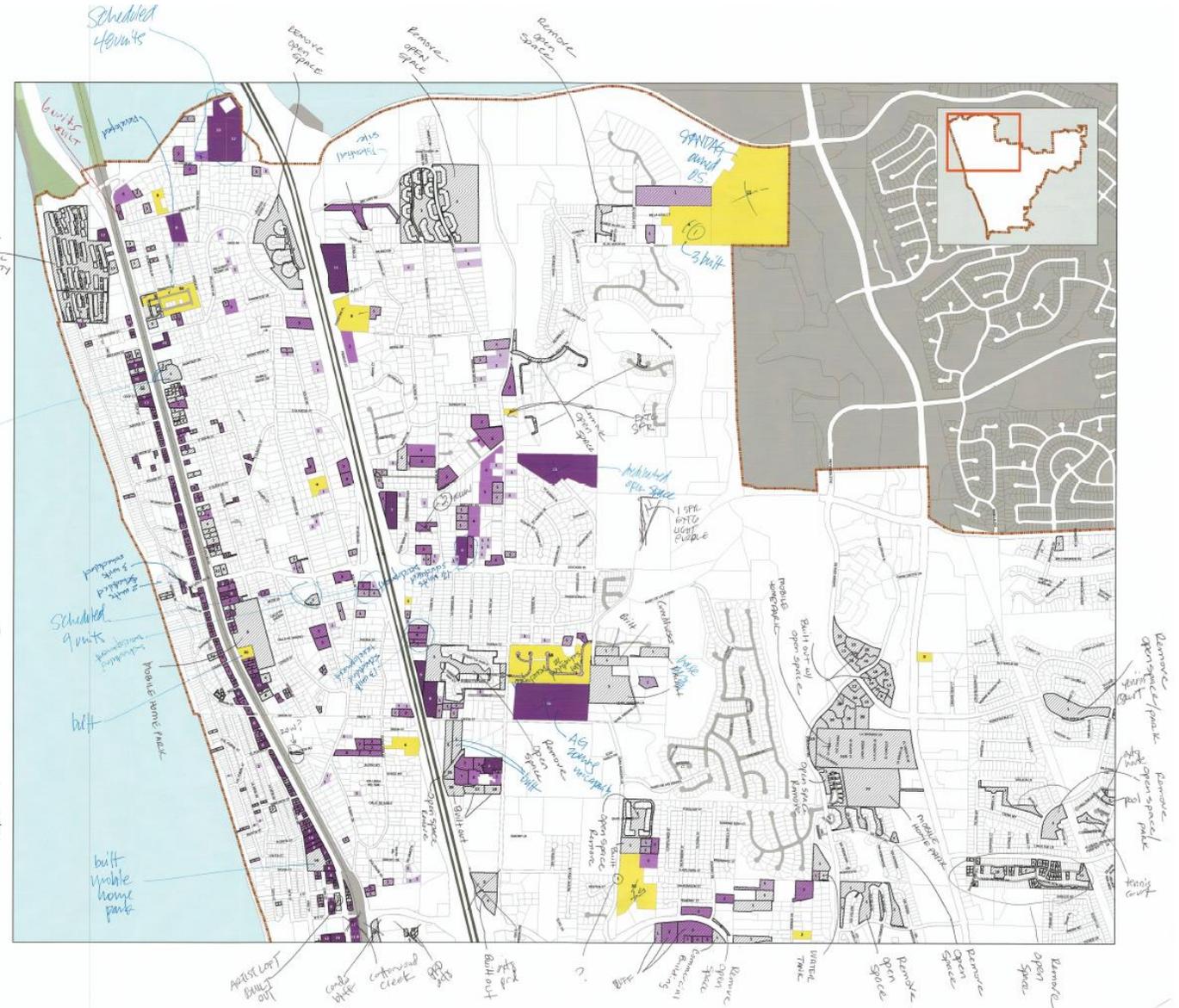
Purple with hatch overlay – parcels which were previously identified in Series 13 and where the SANDAG interpretation of the current municipal zoning "line up" or are in agreement. As a result, those parcels will likely be used again in Series 14 (unless otherwise noted).

Hatch overlay (no purple) – represents parcels identified by SANDAG as having potential for additional residential capacity through interpretation of the jurisdiction's current municipal zoning.

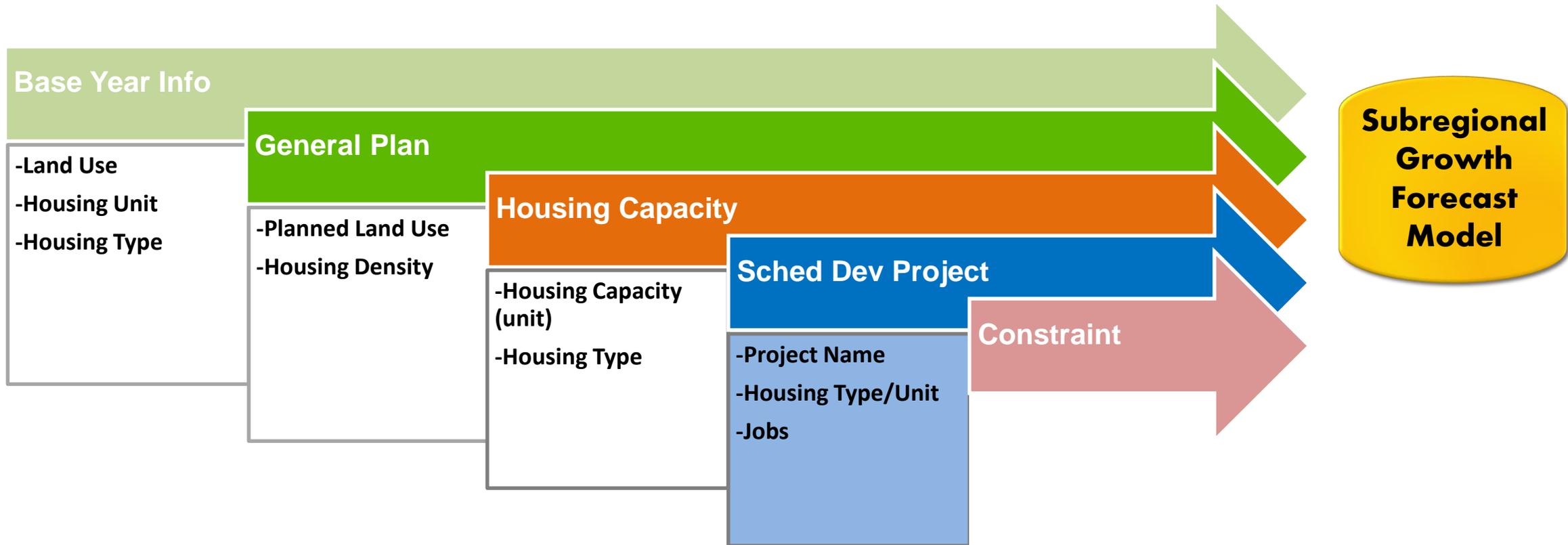
Purple (no hatch overlay) – represents parcels previously identified in Series 13 for additional residential capacity, but not through SANDAG's interpretation of the jurisdiction's current municipal zoning.



Data Source: SANDAG SR14 Regional Growth Forecast
January 2017



Land Inventory System

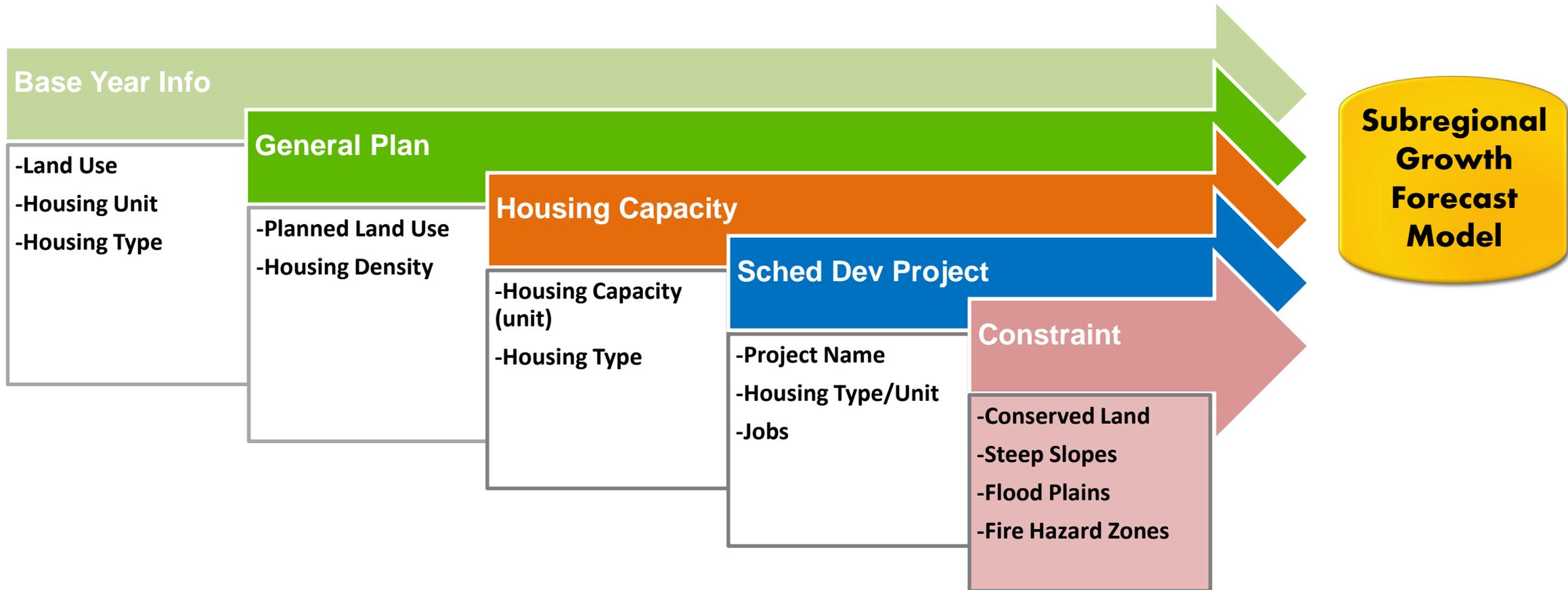


Land Inventory System

Scheduled Development Project

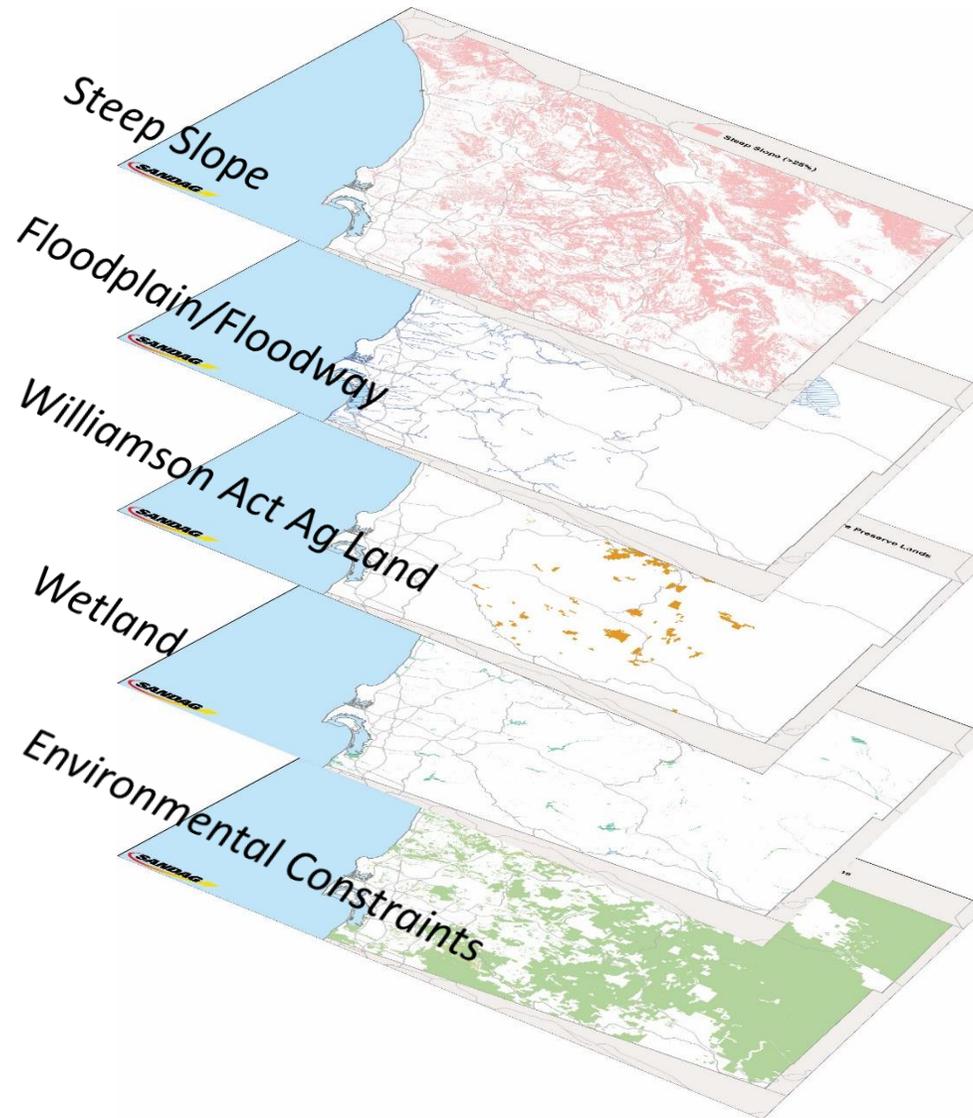


Land Inventory System

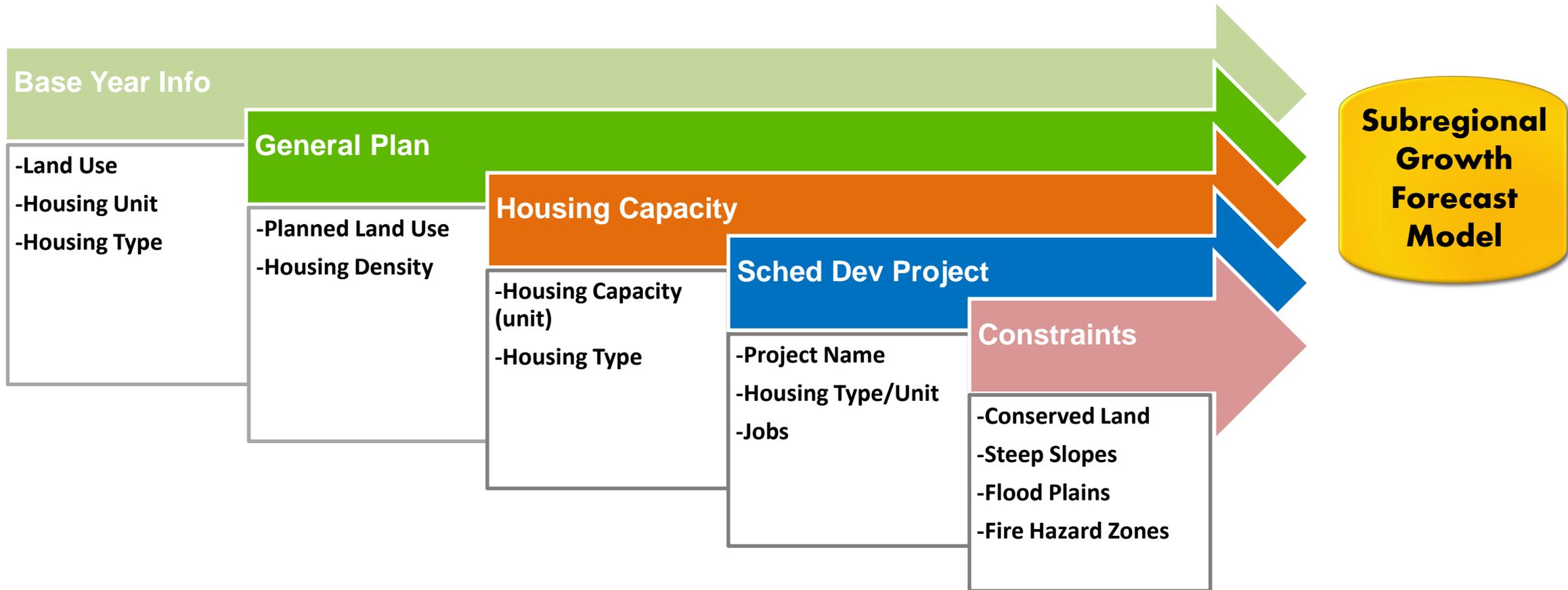


Land Inventory System

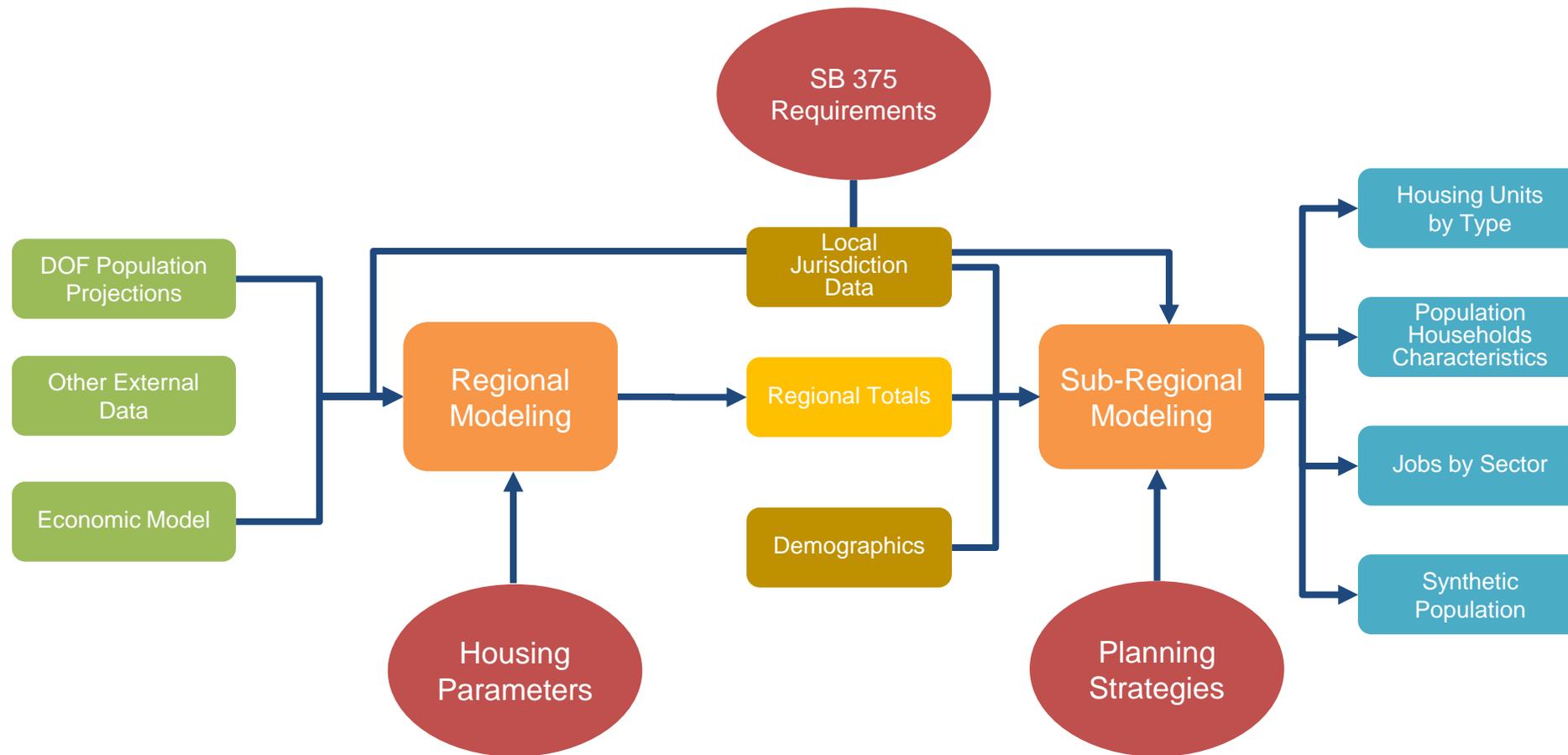
Development Constraints



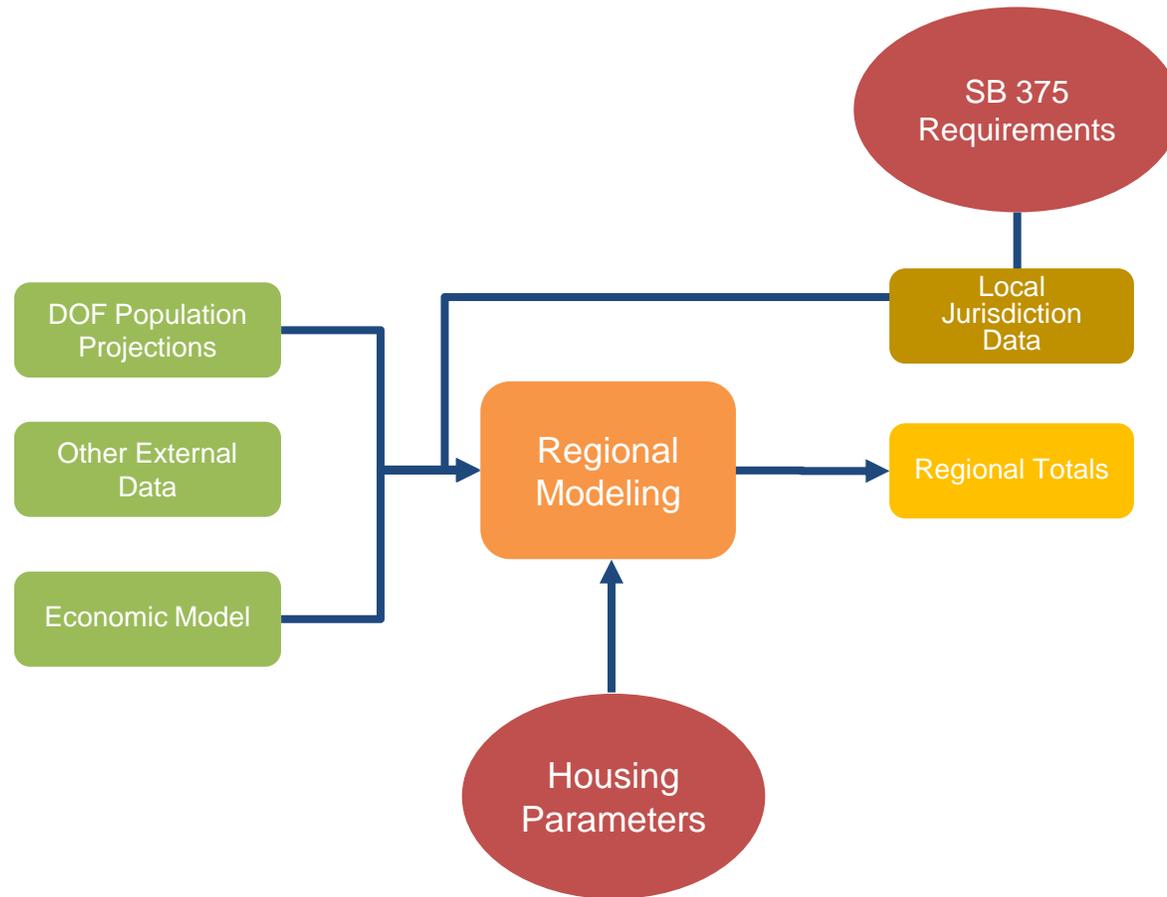
Beast



Regional Growth Forecast and SCS Land Use Pattern



Regional Growth Forecast



DOF Population Forecast

- By age by gender by race-ethnicity
- Annual from current year through horizon year

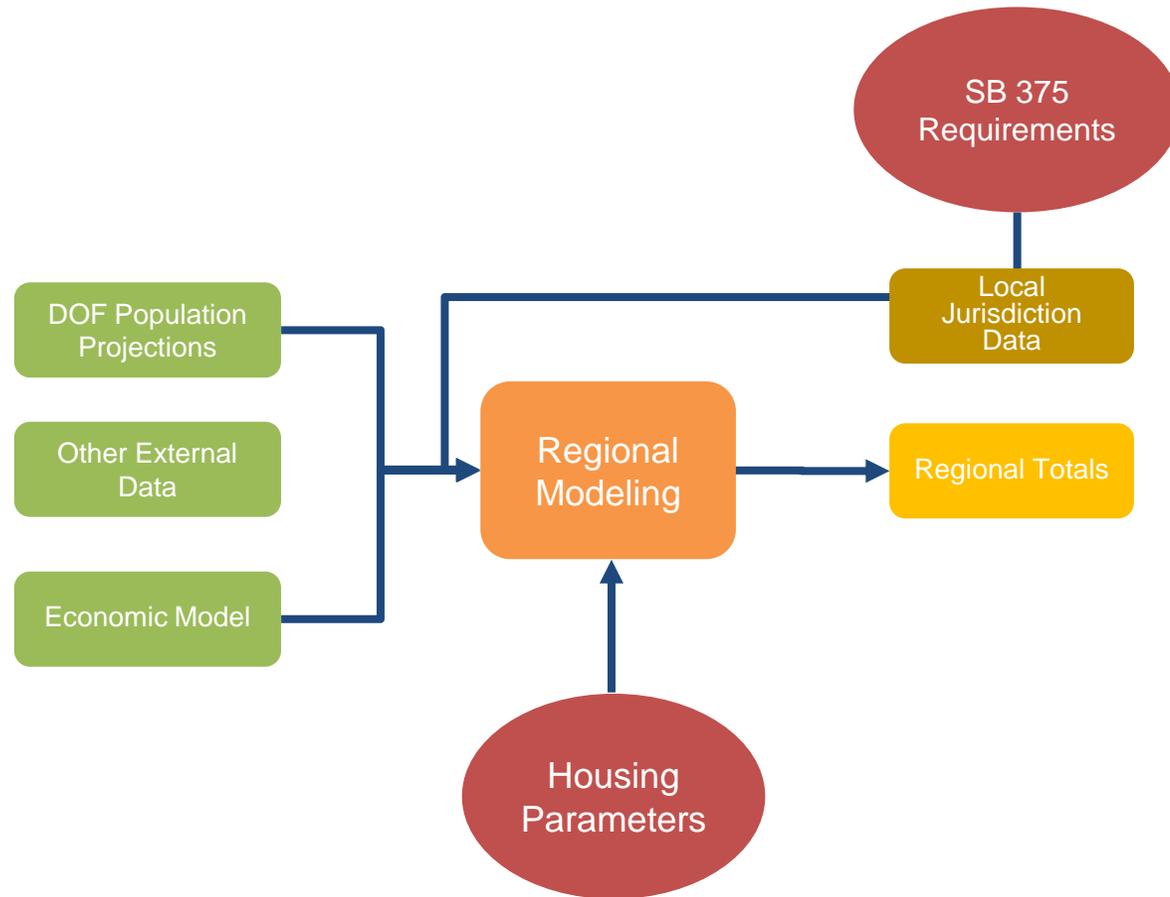
Census Data

- Trends in headship rates and household size
- Vital Statistics
- Migration

Economic Model

- Labor force participation rates
- Unemployment
- Inflation
- GRP

Regional Growth Forecast



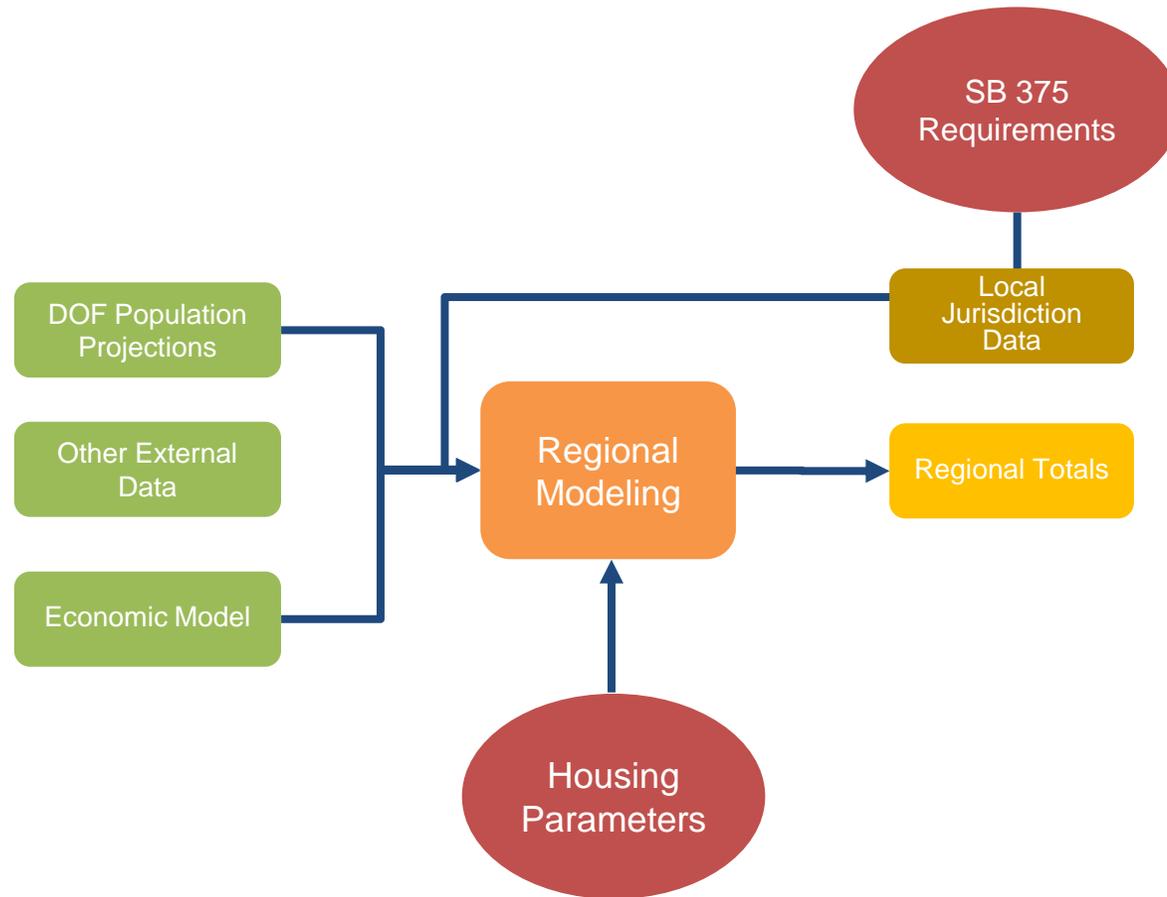
Mandates

- Sufficient housing for region's jobs
- Latest local plans
- RHNA
- GHG

Board of Directors

- Vacancy rate
- Unoccupiable units
- Household size

Regional Growth Forecast



Output - Housing Units

- Based on changing population (count by cohort (age))
- Headship rates and HH size – targeting 2010 (considered “healthy”) levels by 2035
- Considering Unoccupiable units, ADUs (if needed), vacancy rate

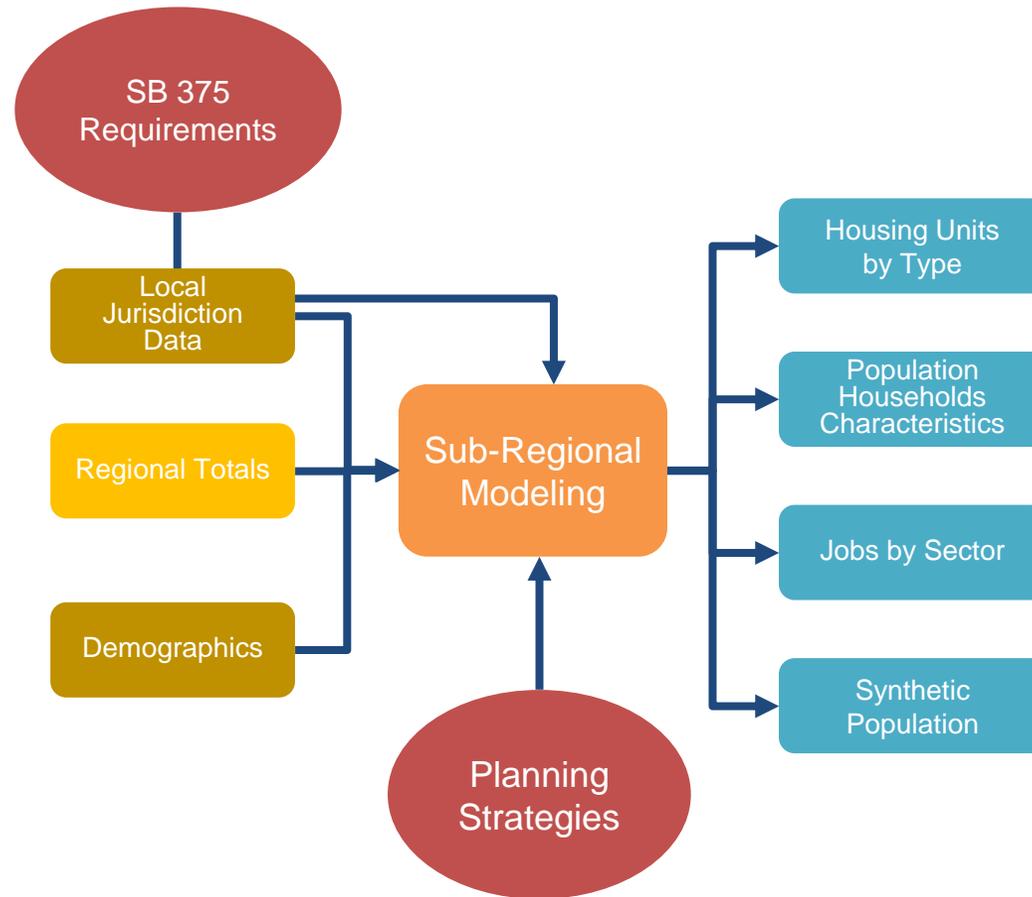
Output – Characteristics

- Census data to convert population into HHs by size and age and race/ethnicity
- Economic model for income

Output – Jobs

- Economic model by sector
- Labor participation rate applied to population by cohort

SCS Land Use Pattern



SCS Land Use Requirements

- SB 375 requires the Sustainable Communities Strategy (SCS) to include a pattern for forecasted growth and development that accomplishes the following:
 - When combined with the transportation network, will achieve the regional greenhouse gas reduction targets;
 - Accommodates the Regional Housing Needs Assessment (RHNA) Determination; and
 - Utilizes the most recent planning assumptions.



Jurisdictional and CPA Totals

- Region to Jurisdiction and CPA
 - Parcel level capacity (from local jurisdictions) within each
 - Scheduled development events
 - Share of region's total capacity
- RHNA mandate
 - Each jurisdiction to meet targets by 2035
 - Increased capacity in Del Mar, Solana Beach, Coronado and Lemon Grove
 - Added to jurisdiction's Smart Growth Opportunity Areas

MGRA Level Totals*

Process Development

- Conducted sensitivity tests with ABM2+
- Drove creation of the Mobility Hub network
- Identified priority areas for housing growth
- Developed MGRA scoring process

* Master Geographic Reference Areas

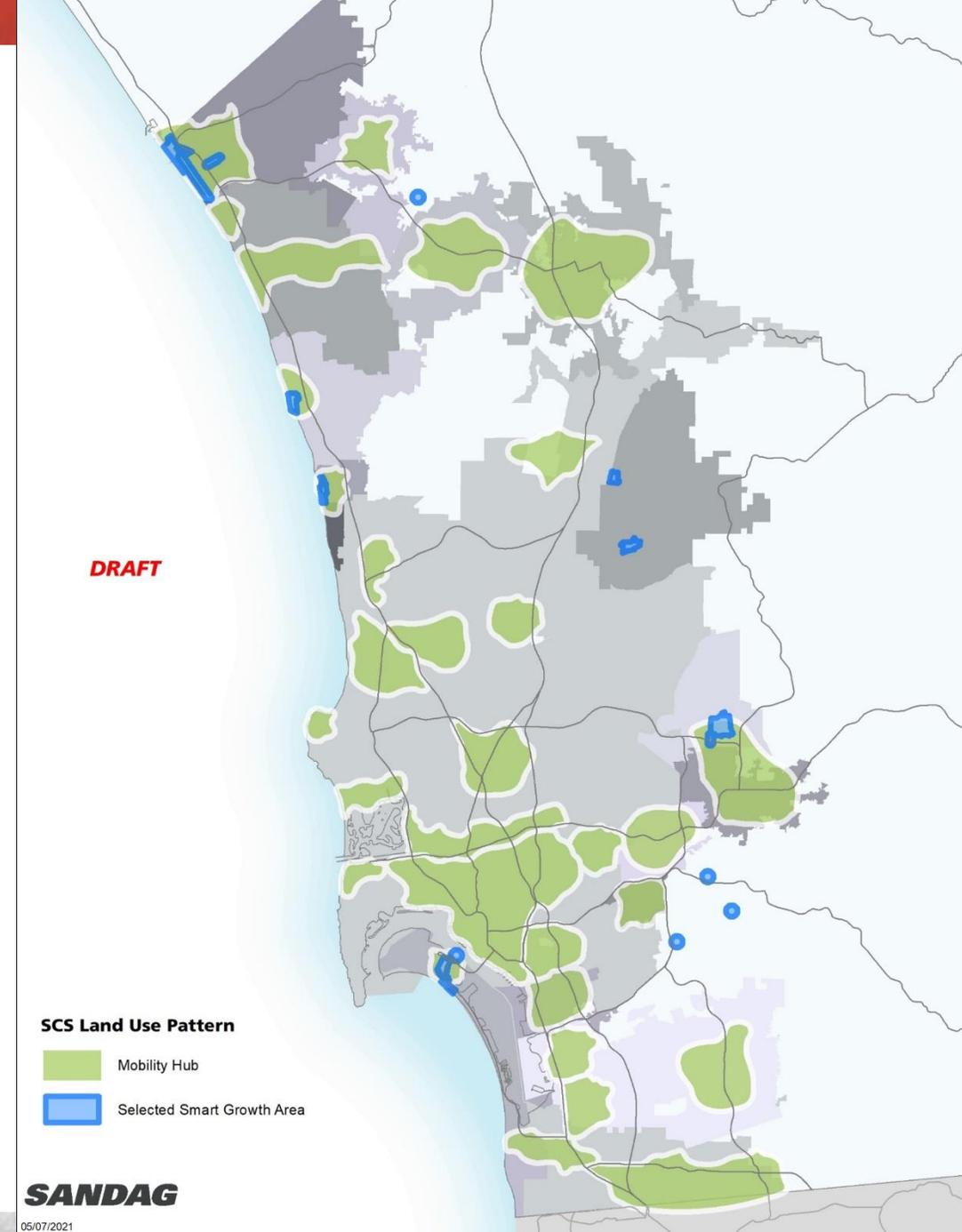
- Similar to census blocks
- 23k in region

Sensitivity Tests - Key Results

- As household growth is focused in low VMT areas
 - Decrease in VMT and auto ownership,
 - non-driving mode shares increase, and
 - trip length for non-work trips decrease
- Developed Mobility Hub Network to prioritize low VMT areas
- Land use mixing factor and opportunities for residential redevelopment considered in SCS Land Use methodology

Areas for future housing and job growth

- Mobility Hubs
- Smart Growth Opportunity Areas



Housing Allocation

- Defining Priority Areas by MGRA (Develop Scoring Criteria)
 - Environmental factors
 - Proximity to job spaces
 - Mobility Hub Propensity Analysis – proximity/presence by mode
 - Land Use Mixing
- For High Scoring MGRAs:
 - Utilize all planned housing capacity
 - Identify potential residential redevelopment to add housing capacity
 - 2050 housing growth not to exceed jurisdiction's planned capacity, except where needed to meet RHNA

Job Allocation

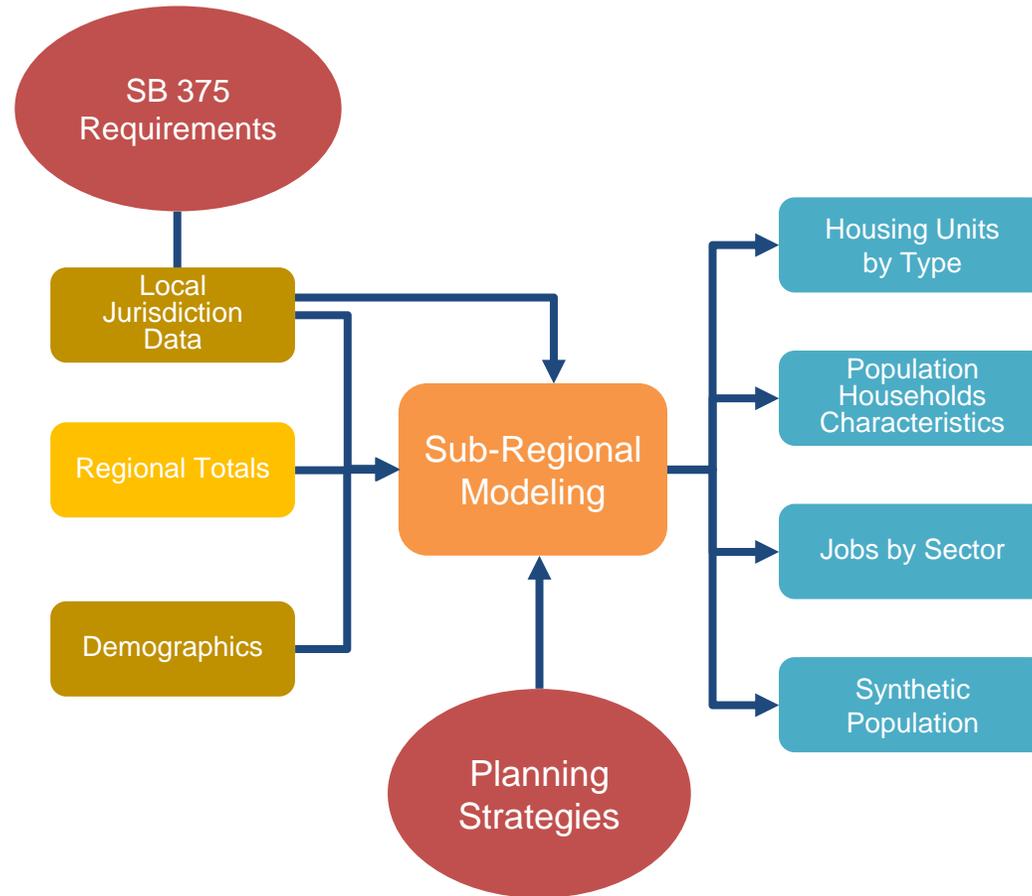
- Focus within MoHubs and SGOAs
- Jurisdiction provided parcel data
 - Supported by planned land use
 - Job capacity exists
- Presence of existing jobs
 - Share within the region
 - In-progress scheduled development
- Additional factors
 - Near new housing
 - Transit
 - Industry sectors

NAVWAR

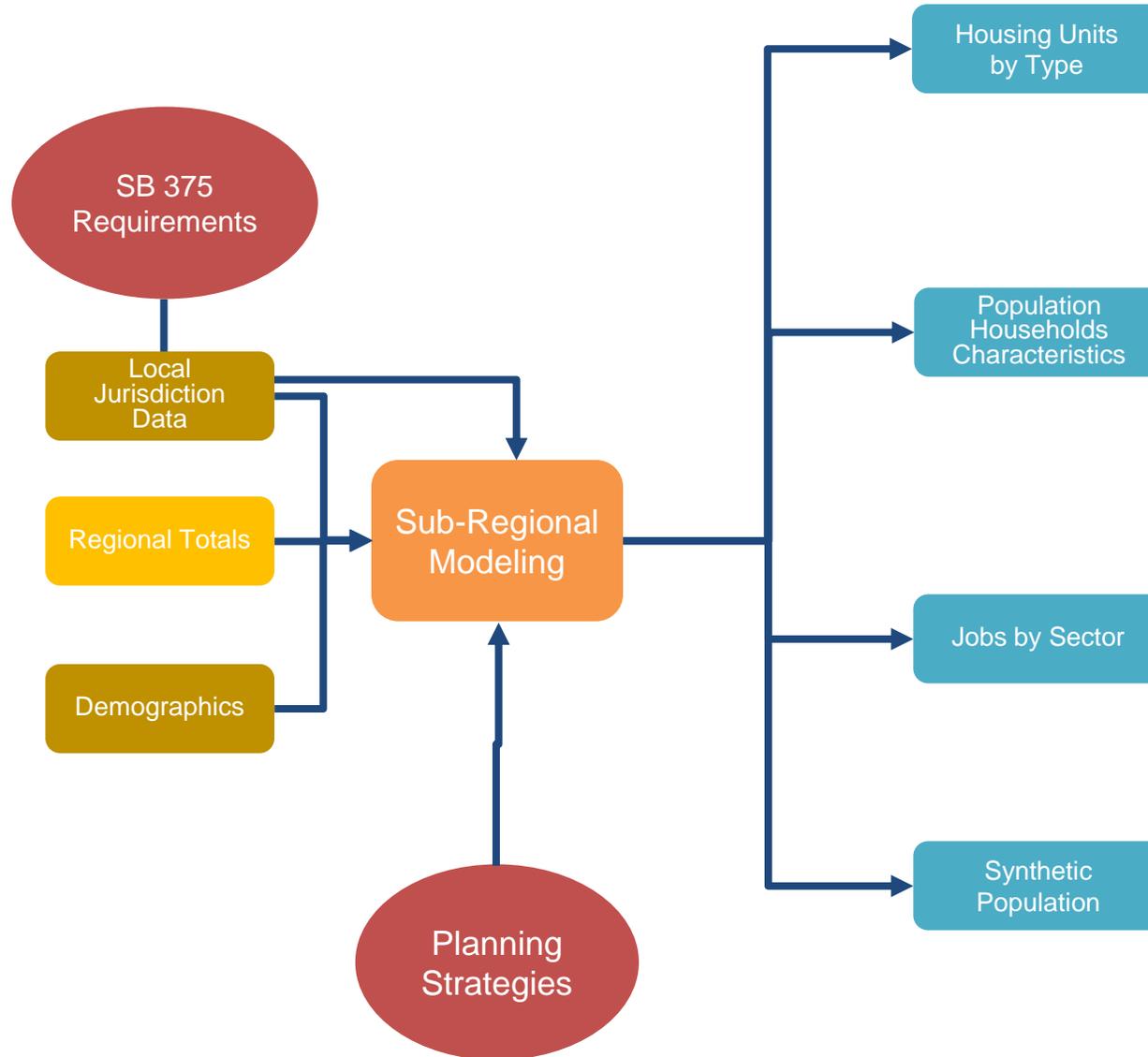
- Includes revitalization of Navy Old Town Campus (OTC)
- Current site of the Naval Information Warfare Systems Command (NAVWAR)

- Includes a Central Mobility Hub at the OTC property
 - More than 9,500 additional housing units
 - Support employment
 - Almost two million square feet of office and retail space
 - Almost 450 hotel rooms

SCS Land Use Pattern



SCS Land Use Pattern



MGRA-level data Annual, 2016-2050

- Housing Units by
 - Single Family
 - Multi-Family
 - Mobile Homes
 - Occupied
 - Vacant
 - Unoccupiable
- Population by
 - Age
 - Sex
 - Race/Ethnicity
 - HH Pop
 - Group Quarters
 - Military
 - Civilian
- Jobs by
 - Industry Sector
 - NAICS Codes
- Synthetic Persons
 - HH ID
 - ASE
 - Education, occupation, work status
- Synthetic Households
 - Income, Poverty
 - Building and Unit info
 - Vehicles, workers



PROJECT UPDATES

Rick Curry
Mike Calandra
Wu Sun

SANDAG





SR 116 OTAY MESA EAST

PORT OF ENTRY



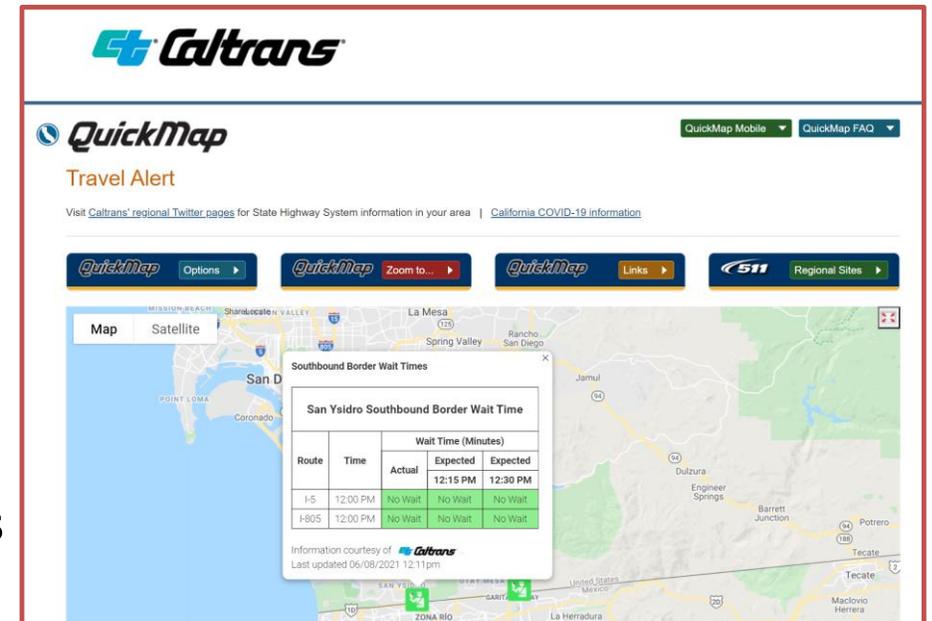
A Vision for Economic Growth, Sustainability, Innovation, and Social Equity

State Route 11 / Otoy Mesa East



State Route 11 / Otay Mesa East Investment Grade Traffic & Revenue Study

- **Binational Traffic & Revenue Model** ➔ **Investment Grade**
- **Schedule** ➔ **Draft Revenue Numbers by July 30**
- **Data Update**
 - Wait times northbound and southbound
 - Traffic counts in Tijuana and SD border region
 - Surveys
 - Passenger vehicle in-person survey – Pre-COVID
 - Passenger vehicle stated preference online survey
 - Commercial vehicle surveys – industry and companies
 - Travel times/speeds
 - INRIX
 - Sin Tráfico



Binational Traffic & Revenue Model Update

Model

- Level II T&R Model still in use
- Methodology changes for opening/closing lanes

Tijuana & US

- Networks
- Internal trips

Cross-Border Demand

- Future growth
 - Commercial vehicles
 - Passenger vehicles
- Origin-Destination
- Value of Time

ABM2+ Subarea Enhancement

• Scope and schedule

- Project Management
- Employment Density Update
- Existing Processes and Model Enhancement Plan
- Model Enhancements
- Application Tests
- Trip Table Data Report and Threshold Definitions
- Final Report and Workshop
- As Needed Support



We are here

Expecting to start in September

ABM2+ production work begins after Board adoption of the 2021 Regional Plan (November)

ABM2+ Subarea Enhancement

- **Employment density update**

- Refresh of existing "Employees per Square Foot" of non-residential space

- SANDAG Data Solutions & Economic and Demographic Analysis and Modeling
- California Economic Development Department (EDD)
- Costar
- Buildings
- ITE

- School employment

- Calculated using existing enrollment-to-employment ratios

- New unit types

- Beds: Update Group Quarters population and scale employment
- Acres: Calculate employment for non-residential uses that do not include building space

ABM2+ Subarea Enhancement

- **Model enhancements for customized subarea ABM scenarios**
 - Convert all scripts to Python
 - Procedures to override residential and non-residential land use assumptions
 - Procedures to update the synthetic population
 - Household sampling
 - Use of a flexible TAZ system to accommodate study areas
 - MGRA is still the atomic geographic unit
 - Build vs No Build
 - The 4D's
 - Automated QA/QC input checking and output reporting

ABM2+ Subarea Enhancement

- **Project challenges**

- Sample rates
- Shadow pricing
- Work location choice
- Commercial vehicle model
- Model run times



JOBS AHEAD

Alt 1



Alt 2

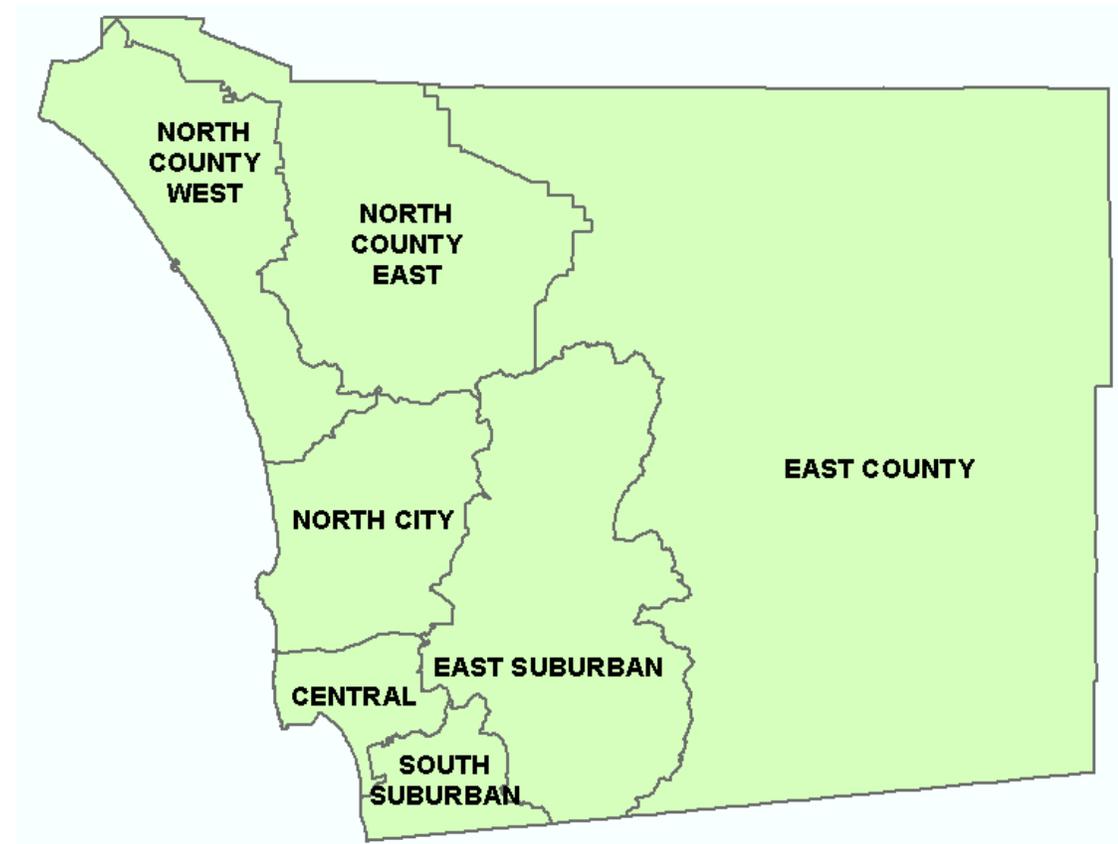
ABM2+ Subarea Enhancement

- **Trip Table Data Report**

- Expected *trips per unit* by land use code
- Parsed by Major Statistical Area (MSA) & Area Type
- **Base year model data -- not observed data!**

- **Subarea Thresholds**

- Define the required amount of Population and Employment in a project study area to render VMT and Mode Choice reports as statistically significant



Model Development Plan for 2025RP

- Priorities-the 4M

- Activity-Based Model (Core Resident Model-ABM3, aka the BEAST per mca)
- Rapid Strategic Model (RSM)
- Commercial vehicle model (CVM)
- Crossborder Model (CBM)

**Features and priorities to be finalized via a series of discussions with stakeholders*

Model Development Plan for 2025RP

- Timeline

- CBM

- Beta working version: 12/31/2021; Final version: 3/31/2022

- RSM:

- 12/31/2022

- CVM

- 12/31/2023

- ABM3

- Beta working version: 12/31/2023; Peer reviewed: 3/31/2024

Model Development Plan for 2025RP

- What about the other Ms?
 - Airport Models (2)
 - Visitor Model
 - External Trip Models
 - Heavy Truck Model
 - TCOV Upgrade?
- Refresh vs Reconstruct
 - Data & Marginal Controls
 - Software
 - Model Structure (aka math, sequence, & algorithms)

Software for 2025RP Modeling

- From CT-RAMP to ActivitySim
- From Java (mostly) to Python
- What is [ActivitySim](#)?
 - AMPO led consortium to create and maintain advanced and open-source ABM software based on best software development practices
 - SANDAG is one of the founding member agencies
 - A suite of light, fast, easy to maintain, and cost-effective models built on top of ActivitySim for 2025RP

Model Development Plan for 2025RP

- Risks & Challenges

- Data, data, & data

- CVM survey
 - Household travel behavior survey that represents ‘new normal’
 - Parking inventory & behavior survey

- COVID impact on base year

- Seems like we will have to change base year in the middle of the project

- Software is heavy lifting

- Futuristic modes & technologies

Forum Agenda Recap

- Welcome and Introductions
- Travel Model Visualizations
- What Feeds the Beast
- Project Updates

**Next
Transportation
Model Forum:**

December 8, 2021



TRANSPORTATION MODEL FORUM

June 9, 2021

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